

University News

MONDAY, JUNE 6, 1988

Rs. 1.50



8th Annual Convocation of the University of Poona. (From L to R) : Prof. S.N. Navalgundkar, Pro-Vice-Chancellor, Prof. V.G. Bhide, Vice-Chancellor, Dr. M.R. Srinivasan, Chairman, Atomic Energy Commission, who delivered the convocation address and Shri Shantanurao Kirloskar, Industrialist.

ANNAMALAI UNIVERSITY

ANNAMALAINAGAR

NOTIFICATION

Applications are invited for admission to the following courses for the academic year 1988-89

**Cost of application form
& Prospectus**

- | | | |
|-----|--|-----------------|
| 1 | M.A Degree | |
| | Branches : | Rs 25 - |
| | 1 Philosophy, 2 Psychology, 3. History, 4 Political Science, 5 Economics,
6. English, 7 Tamil 8 Sanskrit 9. Linguistics, 10 Sociology, 11 Population
Studies 12 Development Studies, 13 Applied Economics, and 14. Translation | |
| 2 | M Sc Degree | Rs 25 - |
| | Branches : | |
| | 1. Mathematics, 2 Statistics, 3. Physics, 4 Chemistry 5. Bio Chemistry
6 Botany, 7 Zoology, 8 Geology, 9 Marine Biology & Oceanography and
10 Coastal Acquaculture, | |
| 3 | M Com Degree (Both English & Tamil medium) | Rs 25 - |
| 4 | M O L (Tamil) Degree | Rs 25 - |
| 5. | B Ed Degree | Rs 25 - |
| 6 | M Ed Degree | Rs 25 - |
| 7 | M Phil, Degree | Rs 25 - |
| 8 | Post-Graduate Diploma Courses | Rs. 25 - |
| | 1 Tourism, 2. Archives Keeping, 3 Translation Administrative Drafting and
Reporting in Hindi, 4 Econometrics, 5 Gandhian Thought, 6 Ramalinga
Philosophy, 7 Guidance and Counselling, 8 Corporate Secretaryship 9 Applied
Linguistics, 10 Insurance, 11 Public Administration 12 Banking Law and
Practice, 13 Population Education, 14. Statistics | |
| 9 | Post M Sc. Diploma Courses | Rs 25 - |
| | 1 Spectroscopy 2 Magnetic Science, 3 Hydro Geology | |
| 10 | Bachelor of Library and Information Science | Rs 25 - |
| 11. | Certificate Course in Library Science | Rs. 10 - |
| 12 | Title of Isaimamani | Rs. 10 - |
| 13 | Title of Natanamamani | Rs 10 - |
| 14 | B Music | Rs 10 - |
| 15 | Diploma Courses | Rs 10 - |
| | 1 Tamil, 2 Advanced Diploma for Proficiency in French 3 French,
4. Linguistics, 5 Languages (Tamil, Telugu Kannada, Malayalam, Sanskrit Hindi) | |
| 16. | Certificate Courses | Rs 10 - |
| | 1 French, 2 Journalism, 3. Folklore, 4 Reprography and non-book materials
5. Language (Tamil, Telugu, Kannada, Malayalam, Sanskrit, Hindi) | |

For application form and prospectus, the REGISTRAR, ANNAMALAI UNIVERSITY ANNAMALAINAGAR 608 002 may be addressed by enclosing (i) a demand draft to the value indicated against each course, drawn in favour of the REGISTRAR, ANNAMALAI UNIVERSITY, payable on Indian Bank or Bank of Madura at ANNAMALAINAGAR or State Bank of India at CHIDAMBARAM and (ii) a self-addressed envelope of size 30 cm x 13 cm stamped to the value of Rs 1.80 with the name of the course for which the application form is required superscribed holdly on the envelope. The name of the course should be clearly indicated in the requisition letter. The application form together with the prospectus will be issued from 25th May 1988

The last date for receipt of filled in application by the University is 30-6-88

The University will not be responsible for any postal delay.

**R Rajmoulickam
REGISTRAR**

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Editor :

UNIVERSITY OF POONA

V.G. Bhide*

University of Poona hosts the Group Discussion-cum-Orienta-
tion Programme on Financial Administration in Universities
being organised by the Association of Indian Universities from
6-10 June, 1988.

The part of the country wherein University of Poona is located, and over which it has jurisdiction is unique in number of respects. This region has had a glorious past in various fields such as spiritual, philosophical, social, cultural, educational etc. It produced such a galaxy of Saints such as Dnyaneshwar, Ramdas, Tukaram, Namdeo, and several others; social reformers like Jyotiba Phule, Vitthal Ramji Shinde, Mahadeo Govind Ranade, Maharshi Karve and others; political thinkers such as Tilak, Gokhale, Ranade, Ambedkar, Savarkar etc. Indeed this region provided a leadership to the country in various fields such as education, politics, etc. and has been a cradle for a number of social reforms and political struggle.

Naturally this region clamoured for a separate University long before the country got its independence. The British Government deliberately overlooked these demands. However, as a result of persistent and strong public upsurge, the Governor of Bombay appointed a committee on 7th February 1942, under the Chairmanship of Rt. Hon'ble M.R. Jayakar, to report on the question of the establishment of a University for Maharashtra. The committee submitted its report on 6th August 1943. No action could be taken on the report of this committee until after the end of Second World War had ended and a popular Congress Ministry came into power again towards the end of 1946. Shri B.G. Kher, Prime Minister and Education Minister, Government of Bombay, took keen interest in the matter and processed the bill for the establishment of this university in the State Legislature.

The First University Act was passed by the Bombay Legislature on 18th February, 1948 and on 15th April of that year, Dr. M.R. Jayakar assumed his office as the First Vice-Chancellor of the University. In the initial stages, he was assisted by an Advisory Committee appointed by the Government. The main task before the committee was to frame provisional statutes and to conduct elections to the various bodies and authorities of the University. After the completion of this process, the University of Poona was formally declared as a corporate body on the 10th February, 1949 by a Government Notification. We moved to this beautiful campus extending over 411 acres in early 1950.

Aims and Functions of the University

The Jayakar Committee outlined the aims and functions of the University as follows :

(1) To lay the foundation of a strong teaching University by creating a central organization in Pune, for conducting directly all teaching in

* Vice-Chancellor, University of Poona, Pune.

graduate and post-graduate courses and for organizing and carrying on research in the Faculties of Arts, Science, Technology, Law, Medicine, and such other faculties as occasion may require.

(2) To lay down by holding, if necessary, a matriculation examination, adequate standards for the admission of students to university courses; to link together and bring into contact with itself, institutions of higher learning in Maharashtra and to co-ordinate research facilities and activities throughout Maharashtra by associating with itself scholars and institutions and by promoting research projects through such scholars and institutions.

(3) While not losing sight of its essential character as a university i.e. a seat of universal learning which recognises no frontiers or barriers except those of the human mind itself, to keep in view the special needs, interests and traditions of Maharashtra and its people and in particular its economic resources, its special problems of agriculture, industry and commerce, and generally the various aspects of its economic and industrial life.

(4) To diffuse widely the benefits of university education among all classes by organising centres of extra-mural teaching and university extension activity and encouraging the production of popular literature on scientific and cultural subjects.

(5) To institute and award diplomas of merit and proficiency in various branches of theoretical and practical study of a standard lower than the degree standard of the university.

One must admire the foresight of the founding fathers of this University that they envisaged some 40 years ago what appears necessary now. The University has over the years kept these objectives in view and planned its programmes of development. May I say that we in the University, have debated on several occasions as the main functions of the university and we could do no better than to spell out these functions in the following language :

(a) To carry out research to expand the horizons of knowledge both concerning the inner world and of the external world and attempt to synthesize the knowledge of the inner and the outer worlds.

(b) To disseminate the known and the acquired knowledge through educational and training pro-

grammes and to inculcate among the students the desired attitudes, outlooks and values.

(c) To apply through extension services the known and the acquired knowledge to solve the perceived problems of the society—social, economic, industrial, etc. and to provide a leadership to the society in various fields.

To nurture and nourish this University, it was our good fortune that Providence provided to us a succession of Vice-Chancellors who had distinguished themselves in several fields and they lent their distinction to the University by their association with it. The University was fortunate to have such illustrious men as Dr. M.R. Jayakar (1948-1956), Dr. R.P. Paranjpye (1956-1959), Professor D.G. Karve (1959-1961), Mahamahopadhyaya D.V. Potdar (1961-1964), Dr. Kakasaheb Gadgil (1964-1966), Dr. D.R. Gadgil (1966-1967), Dr. H.V. Pataskar (1967-1970), Dr. G.S. Mahajani (1972-1975) etc. Under the guidance of these eminent men, the University made rapid progress and has to put it in the language of Dr. G.S. Mahajani: "the University has today the glow of intellectual health about it and so to say it presents academically a photogenic picture. It must also be mentioned that the local ethos of Pune and its surroundings characterised by regard for scholarship and learning has contributed in no small measure to this spectacular progress of this University. Today, it is considered as one of the leading and progressive universities in the country—a seat of learning of which we are justifiably proud."

University Teaching Departments

This University is both a teaching university and an affiliating university. Dr. Jayakar emphasized the importance of university teaching departments and started establishing these on the campus of the University. With his foresight and dynamism, the University departments developed very early. The number of these University departments has been growing steadily over the years. At present, we have 32 teaching departments spread over Faculties of Arts; Science; Engineering; Law; Mental, Moral and Social Sciences; Commerce; Management, etc. With the growth of University departments, the number of faculties has also been steadily increasing. Only this year, we added a new faculty called the Faculty of Management.

These university departments are at various stages of development. There are four Centres of Advanced

Studies in the University. These are: Centre of Advanced Studies in Sanskrit; Centre of Advanced Studies in Economics; Centre of Advanced Studies in Linguistics and Centre for Advanced Studies in Solid State Physics and Material Science. This last was granted by the UGC this year

The University Grants Commission on the recommendation of the Science Advisory Committee to the Union Cabinet launched a programme called the COSIST (Committee on strengthening of infrastructure in Science and Technology) to identify a very few select departments in the Science and Engineering faculties for strengthening them by equipping them so as to make them comparable to the corresponding departments in advanced countries. The selection of these departments is rigorous and is based on quality of teaching and research programme, achievement of the staff, etc. Four of our Science Departments namely Physics, Chemistry, Statistics and Zoology have received substantial assistance from the UGC under this programme. The selection of the departments under this programme is not only an honour but is also a recognition of the quality of the work and the standing of these departments in the country

Next in order of importance and distinction is the programme of the University Grants Commission called the Departments of Special Assistance. Five departments of this University namely Physics, Chemistry, Mathematics, Statistics and Zoology have been recognized as Departments of Special Assistance. The case of the Department of Geology is being processed.

On the Arts and Social Sciences sides, there is a programme called the University Leadership Programme. Our departments of Politics and Public Administration, Sociology, Sanskrit, Philosophy have received recognition under this scheme.

Through the assistance of the University Grants Commission, the University established recently two new departments namely (1) Department of Electronic Sciences, and (2) Department of Computer Science. The Department of Electronics, Government of India suggested to the UGC to select four Universities for establishing Department of Electronic Science and this University has the honour of being one of these four. This department of Electronic Sciences is expected to emphasize more on Science of Electronics rather than electronics engineering and

will be funded liberally by the Department of Electronics, Government of India, and the UGC. Similarly, the Department of Computer Science of this University is unique and is perhaps the strongest computer science department in the country. It provides facilities for training leading to M.Sc. in Computer Science, M.Tech. in Computer, Master in Computer Applications and Ph.D. in Computers.

The University has during this year started two new departments on its own and these are (1) Department of Economics, and (2) Department of Commerce. We are fortunate to receive the guidance of Prof. V. M. Dandekar for our department of Economics.

All the departments continually try to update teaching programmes and turn out quality research work. Many of the Professors of the University have been awarded national lectureship of the UGC and chaired national and international conferences. About 1000 research papers are published every year. The University awards roughly 250-300 Ph.D. degrees in various subjects.

Linkages with National Institutions

One of the most pace setting experiments which the University launched is the one concerning organization of post-graduate teaching programmes in collaboration with National Institutes. This has helped in improving considerably the quality of post-graduate teaching in the University.

TIFR Physics Department Programme

The most important of these experiments is the one concerning the organization of M.Sc. Physics teaching jointly by the TIFR and the Physics Department. Tata Institute of Fundamental Research, Bombay is the national centre for Physics and Mathematics. In the joint programme, the syllabus of the M.Sc. Course is jointly evolved and taught by the faculty from TIFR as well as from the Physics Department. Two senior members of the faculty from TIFR spend one semester on our campus to participate in the teaching programme. We were fortunate to have Prof. B. M. Udagankar, Prof. Jayant Narlikar and others participating in this programme. The admission to this programme is carried out through a nation wide competitive examination. The TIFR provides scholarship of Rs. 400/- to twenty students. The UGC has agreed to provide scholarship to another twenty students.

Joint teaching programme also aims at modernization of M.Sc. laboratories and undertaking joint collaborative research programmes. Similarly, some select students carry out their project work in the TIFR. This joint teaching programme has been a great success and has produced a sea change in the quality of education. The programme is highly popular in the country and this year nearly 1500 students from all over the country competed for twenty seats.

*National Chemical Laboratory and
Department of Chemistry Interaction*

Encouraged by the success of the TIFR-Physics Department Interaction, National Chemical Laboratory, Pune offered to participate in postgraduate teaching in Chemistry. Scientists from NCL give course of lectures along with professors from the Department of Chemistry. In this programme also, NCL gives scholarship to twenty students selected through a competitive examination. This interaction is not only restricted to the teaching but extends over collaboration in research.

Last year NCL and the Department of Chemistry installed a unique joint facility for neutron activation analysis on our campus. This is a unique facility in the country and is used to carry out nuclear chemistry research and for detection of impurities to the level of few parts per million or better.

*National Geophysical Research Institute and
Department of Geology Interaction*

Following the footsteps of National Chemical Laboratory, National Geophysical Research Institute, Hyderabad offered to participate in the teaching of M.Sc. Geology in cooperation with our faculty. NGRI has also established some unique seismic facilities here.

*India Meteorological Department and Radio and
Space Physics Group Interaction*

A similar joint collaboration has now been evolved between the India Meteorological Department, Indian Institute of Tropical Meteorology and our Radio and Space Physics Group. These two institutions located at Pune also participate in the teaching of few courses in the Geography Department.

This cooperation and interaction with national laboratories and institutes are the first of their kind

in the country and has been deeply appreciated by the UGC, Science Advisory Council to the Prime Minister and the Academy of Sciences. More than that, our students have benefitted tremendously through these interactions.

Honorary and Emeritus Professors

In addition to the above mentioned interaction with national institutes, we have sought to strengthen our postgraduate teaching and research by introducing a system of Honorary and Emeritus Professors. We are indeed fortunate that we have such a large number of eminent men in various disciplines living in Pune. The University is convinced that if some of these eminent people come and talk with our students, it will not only help to excite the curiosity of the students, but will enable them to do better. With this end in view, we requested some of the eminent people to accept our invitation to become Honorary Professors.

*Introduction and Strengthening of
Inter-Disciplinary Culture*

The University realized the importance and the need to introduce and strengthen interdisciplinary culture. I do not need to stress the importance of interdisciplinary effort. The borderline areas between two disciplines are always exciting and fertile. Just as it is easier to penetrate the grainboundary area between the two grains of a crystal than to penetrate the grain itself, the Q of the system is very high when one is probing on interdisciplinary area rather than probing a mono-discipline area. Indeed today, Science and Technology has no more remained monodiscipline oriented but flourish as a result of interdisciplinary effort and interaction. Realizing all this, the University has sought to strengthen interdisciplinary effort in two different ways.

In one aspect of our effort, we have grouped the departments to form schools. Thus a School of Life Sciences comprises of (1) Department of Zoology, (2) Department of Botany, (3) Department of Microbiology, and (4) Department of Biochemistry. Similar schools have been established in other areas. Thus, we have the following schools—(a) School of Life Sciences, (b) School of Earth Sciences, (c) School of Mathematical Sciences, (d) School of Physical Sciences, (e) School of Chemical Sciences, (f) School of Languages, (g) School of Social Sciences. This

grouping could be possible because the University faculty realized that there is so much in common in terms of concepts' techniques and infrastructure

Interdisciplinary Schools in Nationally Relevant Areas

In addition to the above schools formed out of grouping of various departments, the University has identified some areas of national importance such as Energy, Communication, Environment Materials, Behavioural Sciences, Social Sciences, etc

Each of these schools has organized their teaching programmes and have undertaking research projects. The research team, for pursuing research project, is drawn from various departments depending upon the nature of the problem. Many of the schools have done pioneering work and have made unique contributions which have been recognized all over the country

The school of Communication deals with development of communication packages for a variety of purposes such as (a) for distance education (b) for adult education, (c) for countrywide classroom programme of the UGC (d) for upgrading trades etc. This school has one of the most equipped TV studios in the country. It has also the facility for outdoor shooting. The school has conducted various training programmes and has contributed the most to the countrywide classroom programme of the UGC. The school has also a very prestigious programme on Development Communication Research Project. Under this programme which is funded jointly by the Government of India and United States Department of Agriculture the School collaborates with four leading Universities in US, namely, Universities of Cornell, Stanford, Nebraska, Michigan. All these four Universities along with the School of Communication develop communication packages aimed at motivating people for rural development population studies, public health etc.

The school is in a position to undertake work on commercial basis on behalf of industries, commercial establishments, etc. Indeed they have worked for ONGC, Nirlon and several others. Recently, the school has started screening of video films aimed at popularization of science, educational programmes for the general public. The school has received financial assistance

from US Department of Commerce, UGC, British Council, DST, etc.

The School of Energy Studies concentrates on development of techniques and technologies for the utilization of non conventional sources of energy such as solar, wind, biogas, biomass etc. The school introduced a concept of Autonomous Decentralised Integrated Energy System for Rural villages. There are a large number of villages in this country which are unelectrified. It is equally difficult to reach them with fossil fuels. Consequently, these villages have to rely on the energy sources locally available. This has led to serious deforestation threatening the ecosystem and inefficient burning of cattle waste depleting the farm of organic manure. The school of energy studies carried out a survey of nearly 100 villages in relation to energy resources and energy consumption pattern as of today and likely extrapolation five year hence. Surprisingly, the energy resources in the village are more than sufficient to meet not only the energy requirements of the village today but also of its likely requirement five year hence. The school then proceeded to develop techniques to convert the available energy resources in the village to the form in which it is needed. Then they optimized the energy system using energy mix. A pilot experiment was undertaken in a village SHIRKOLI about 30 kms away. This village has a population of 407. This village has now a gasifier with a generator coupled to it to produce 15 KW of electrical energy, three community biogas plants solar cookers etc. The villagers not only satisfy their energy needs for cooking lighting pumping but also have facilities for community Radio and Television, communication to a neighbouring town etc. There is a small workshop fitted with lathe, drilling machine etc. The school's efforts have been highly appreciated and the Government of Maharashtra decided to set up such Urja Grams at least one per district. These are in the process of development.

The school developed a variety of things such as solar cookers, solar driers, solar hot water systems etc. These have been passed on to the industry. The school set up 100 ton solar drying plant for M/s Weikfield for drying of edible strach. The school has developed the complete knowhow to convert grapes into raisins. The school is in the process of setting up two plants one at Nasik and the other at Sangli.

The school works closely with industry and has received financial assistance from a variety of sources including private and public sector industries, Govern-

ment departments, etc. The school has also a few international collaborative programmes. The school acts as a nodal agency on the Indian side for the project on Amorphous Silicon Solar Cells undertaken under the Science Technology Initiative agreement signed between Prime Minister of India and the President of the United States.

The School of Environmental Sciences has its own teaching programmes and actively participates in Western Ghats development programme of the Department of Environment. Recently, Department of Environment expressed a desire to enter into a long term agreement with the University for undertaking Environmental Impact Assessment of various development projects.

Other schools are also equally active in their respective fields.

Establishment of National Facilities on the Campus of the University

Giant Meterwave Length Radio Telescope

The University has always expressed its deep concern regarding the fact that various national facilities and national laboratories were established in the past outside the university system. This led to siphoning of men and resources from the universities to national laboratories. To add to this, the national laboratories being relatively new and few got funded liberally at the cost of funding the universities. The universities in the process, got impoverished. Indeed, today, the universities work on shoestring budget. Over the years, the university system has been allowed to run down so much that if nothing is done to bring back the center of gravity of academic activity to the university, the situation may as well become irretrievable.

We have been continually arguing at the national level that henceforth any national facility that may be set up should necessarily be on the campus of the University though not under the administrative control of the university. Our pleas received sympathetic consideration and it has been decided to set up some of the national facilities on the campus of our university and a few others are under consideration.

The Department of Atomic Energy, Government of India, through Tata Institute of Fundamental Research have decided to establish Giant Meter

Wavelength Radio Telescope near Pune, with its academic headquarters on the campus of the university. This will be the largest radio telescope in the world. The telescope will be fabricated locally in India and University of Poona will participate in the fabrication. The academic headquarters, technical back up facilities will be located on the campus of the university. This project is going to cost Rs. 20 crores and is bound to give a tremendous boost to research in Astrophysics, Astronomy, Cosmology etc.

In order to take maximum advantage of this national facility, we have proposed to the UGC to set up a center for Astrophysics and Astronomy in the University under the joint auspices of the TIFR and University of Poona. During the recent discussions in the University Grants Commission, the Chairman accepted this proposal in principle and even suggested that the proposed center should be an interuniversity center. The proposed center will utilise the unique facilities at GMRT for training and carrying out research. The GMRT and the proposed center will be complimentary to each other. This is the first time in the country where such an arrangement has been evolved and worked upon.

National Biotechnology Programme

Life sciences are experiencing an excitement comparable to what Physics experienced in the early years of this century. There is an effort to synthesize various aspects of life sciences such as Molecular Biology, Molecular Biophysics, Genetic Engineering etc. and explain all of them on the basis of the behaviour of molecules. This attempt has proved to be highly successful and has brought about remarkable developments which have provided us with deeper insight into the life processes. More importantly the knowledge acquired through these studies has been put to applications in industry, medicine, agriculture etc. Realising the importance of this area, the National Biotechnology Board decided to set up national biotechnology training programme in some select universities. Our university was selected for this training programme. This programme started two years back and the first batch is likely to come out in May-June 1988.

National Bioinformatics Center

The Department of Biotechnology, Government of India have approved of the setting of a National

Bioinformatics Center in our university. This center will be a repository of all the papers and publications in the area of biotechnology. This will be a unique facility.

National Animal Cell and Tissue Culture Facility

The University of Poona succeeded in persuading the Department of Biotechnology GOI and the Indian Council of Medical Research to set up national animal and tissue culture facility on the campus of this university. The objectives of the facility are

To receive, identify, maintain, store, grow and supply, (a) animal and human cell lines, both existing and newly developed, (b) tissues, organs and fertilised eggs and embryos (c) Hybrid cells—including hybridomas, (d) unicellular obligate pathogens, parasites and vectors, and, (e) plasmids, genes and genomic library

The National Animal Cell Tissue Culture facility will be established on the campus of the university and will be administered by Indian Council of Medical Research. The funding for this facility would be received from the Department of Biotechnology. As in all other national facilities we are stipulating that the facilities should be available to the students and teachers of the university and further senior persons in these facilities should teach in our departments.

Training cum Research and Development Center in Bipolar Integrated Circuits Technology

The University of Poona and the Electronics and Trade and Technology Corporation of the Government of India, have proposed to the Department of Electronics, Government of India the setting up of training cum research and development centre in Bipolar Integrated Circuits Technology. Electronics Trade Technology Corporation is a public sector organisation and has undertaken in the past and proposes to undertake in future setting up of plants and carrying out turnkey projects in other countries. Only recently they completed a project, aimed at setting up integrated circuits plant in South Korea. In undertaking projects of this type, they have to provide training facilities. The proposal to DOE is essentially meant to meet this demand. The proposed training cum research and development center will be located on the campus of the university. Our department of electronics sciences will work in close collaboration with this center utilising the facilities from this center.

Besides taking advantage of national facilities, University of Poona continually strives to establish close contacts with various national agencies. The Department of Geology has very fruitful collaboration with Oil and Natural Gas Commission. Indeed the Department has agreed to conduct training courses for the ONGC personnel. Similarly, the department of Geology trained personnel from the ground water department of Government of Maharashtra in interpreting remote sensing data and in prospecting for ground water. The department also provides consultancy services in this respect to the individual farmers and organisations.

Department of Journalism works in close collaboration with local journalists in the city. Department of History has forged collaboration with the famous Itihas Sanshodhak Mandal. Department of Sanskrit participated in the preparation of Sanskrit Dictionary and collaborates with Bhandarkar Oriental Research Institute.

In much the same way every university department has very close links with the national organisations in their respective areas.

Introduction of flexibility in the system

University strongly believes that flexibility is essential for teachers and others to innovate and experiment. Appraising this the University continuously attempts to provide for flexibility and autonomy. Indeed, the University has now become famous on this count and our system is referred to as Pune pattern.

University departments have been given academic and financial autonomy. Indeed, heads of departments operate their departmental budgets, invite quotations, place orders etc. Some select departments such as Physics, Chemistry, Statistics, Zoology have been given academic freedom in the sense that they can evolve their courses, teaching pattern, evaluate their students etc. This academic and financial flexibility has gone a long way in innovating new teaching methods and programmes and has helped in accelerating the pace of development.

Interaction with Industry Science and Technology Park

One of the most significant achievements of this university, for which it is not only known in the

country but also elsewhere in the world, is relating to its sustained and fruitful efforts to forge interaction with industry.

The University not only took the survey of the industrial infrastructure and employment potential in the industries in and around Pune, it also identified major constraints to growth of the industries. While identifying the constraints, the university became aware of the tremendous potential for growth. The constraints to growth are:

(1) The small scale sector does not have adequate test, certification and quality assurance facilities. In the absence of test and certification facilities, the products they turn out have no market and more often the products are substandard.

(2) Unlike small scale sector, elsewhere in the country the small scale sector in an around Pune is more technologically oriented. Some four-five engineers get together and start an enterprise. They are bright people. They wish to diversify and have some bright ideas about it. However, because of the lack of developmental infrastructure, they fail to translate their ideas into industrial products.

(3) There are very bright boys in the University. They carry out some very novel and innovative work. However, they are not aware of the application of this work for industrial production. Consequently all this good work merely ends in a publication of a paper or submission of a thesis but does not lead to economic growth.

(4) There are a large number of Indians particularly from this region who are doing extremely well abroad. They wish to duplicate their operations here in Pune with the help of their relatives or friends. In this case, the technology can flow freely but even to adopt this technology to local skills, local materials, one needs a certain amount of developmental effort. In the absence of this infrastructure, this avenue of growth is also not availed of.

In order to overcome these constraints, a series of meetings were arranged and it was decided to establish Science and Technology Park on the pattern of similar parks in the USA and UK on the campus of this University. The objectives of the park are :

(1) to establish a facilitation center which will include test and certification facilities, developmental infrastructure etc.,

(2) to broaden and raise the level of small scale sector by introduction of somewhat modern techniques,

(3) to make available to the industries the results of novel and innovative work being carried out in the university,

(4) to undertake short term, well defined training programmes for persons sponsored by the industry,

(5) to develop and promote entrepreneurship among young boys and girls so that instead of becoming job seekers they became job creators,

(6) to provide consultancy and to make available to the industry the following infrastructure facilities such as, (1) computers, (2) language translation facilities, (3) audio and video recording facilities

During the short time this park has been in existence. It has performed remarkably well. Of course, the actual work of innovation, application etc. is carried out by the students and the faculty.

One of the most outstanding achievements of this activity is the use of high energy electron beam to tailor the characteristics of high power silicon devices, particularly the turn off times leakages current etc. BHEL, Bangalore and the Physics Department together evolved this technique. Today, every power device manufactured by BHEL, Bangalore, is processed in our department. The department was awarded a special award by Electronics Devices Manufacturing Association for best research. The department of electronics has recently sanctioned Rs. 40 lakhs to the department for making the machine. Similarly, a large number of processing industries are ready to use this state of the art techniques. This unique facility is the only one of its kind in the country. Department of Space has signed an agreement with the university for the use of this facility to test the space quality solar cells.

The other remarkable development is the novel work related to surface modification using ion-implantation, laser beam etc. The University has developed a unique method for modifying the surface layers without altering the bulk so that various surface sensitive properties such as oxidation, corrosion, catalysis, chemisorption etc. can be controlled. We have also evolved very novel techniques for surface

hardening, preparation of superhard layers of TiC, TiN etc. These techniques have tremendous applications in number of industries. Ours is one of three groups in the entire world and that there is such a demand from all over the world even from Bell Telephones, Xerox Corporation, for collaborative work.

Similarly our work on microprocessor based instrumentation, pollution control, on biotechnology, tissue culture has attracted considerable attention.

National Science Foundation of USA, Phillips, Holland and several other agencies have evinced keen interest in this endeavour and have offered us help and assistance. Equally gratifying is the response of industries from Pune. Another significant achievement has been launching of small and young entrepreneurs.

University and Affiliated Colleges

This University is partly a teaching and partly an affiliating university. At the time of the establishment of this university, the jurisdiction of the University extended over 12 districts. However, with the establishment of Shivaji University at Kolhapur in 1964, the jurisdiction of this University was reduced to five districts namely Jalgaon, Dhule, Nasik, Ahmednagar and Pune. In spite of this reduction in the area, the University has been making impressive quantitative as well as qualitative growth.

In the year 1950, the University had 18 colleges, affiliated to it with 8600 undergraduate students. Today, inspite of the reduction in the jurisdiction, the University has 189 colleges, spread over various faculties affiliated to it. The following table gives the growth and distribution of the affiliated colleges over the period of last six years.

TABLE I : Number of Colleges (Facultywise)

Faculty	80-81	81-82	82-83	83-84	84-85	85-86	86-87
Arts, Mental, Moral and Social Sciences, Science, Commerce							
1 Arts, Science, Commerce	32	34	34	35	42	42	44
2. Arts and Science	5	5	6	6	6	6	7
3. Arts and Commerce	40	40	44	52	53	54	57
4. Science	1	1	1	—	2	2	3
5. Commerce	7	7	6	10	14	14	15
Law	9	9	9	9	9	9	9
Engineering (including Architecture and Printing Technology)	2	2	2	16	19	20	22
Medicine (including Pharmacy)	2	2	3	3	5	5	6
Ayurveda (including Homoeopathy and Unani)	6	7	5	6	7	8	8
Education (including Physical Education)	11	11	12	12	12	12	17
Fine Arts	—	—	—	1	1	1	1
	115	118	122	150	170	173	189

TABLE II : Strength in Terms of Student Enrolment

No. of Students	80-81	81-82	82-83	83-84	84-85	85-86	86-87
Below 300	49	46	26	61	69	69	72
Between 300-500	23	22	16	35	28	30	40
Between 500-1000	13	18	36	26	34	35	38
Above 1000	30	32	44	28	39	39	39
	115	118	122	150	170	173	189

There has been a corresponding increase in the number of students enrolled and appearing at the examination. The number of students taking examinations of the University increased from 70,000 in 1979 to roughly 1,50,000 in the year 1987.

The Colleges affiliated to the University have varying sizes, standards and standing. The distribution of colleges according to the student enrolment is given in the Table II (on page 9).

Correspondingly, the number of teachers in affiliated colleges has increased from 3000 in 1970 to over 5000 in 1985-86.

Some of the colleges are highly developed and are about 100 years old, whereas some of them are one year old. The same disparity exists in relation to standards and attainment. It may be mentioned that nearly 40% colleges are non-viable colleges. Many of the colleges do not have adequate and adequately qualified staff. Similarly, these colleges have very poor infrastructure in relation to library, laboratory, hostels, play fields, etc. The geographical distribution of these colleges is more or less even and seem to cater to a variety of needs such as. (a) discipline and subjects, (b) backward classes, (c) women, (d) minority community, etc.

It must be said, at this point, that in this part of the country there is a long tradition of private enterprise in education. Indeed, all the colleges are private colleges. Some of the colleges have done outstanding work and produced a galaxy of people who have become leaders in various fields of human activity such as in Politics, Science, Commerce, Industry, Sports, Dance, Drama, Music etc. Before independence, these colleges attracted very eminent men as teachers at tremendous self-sacrifice and it is through their example they produced generations of students fired with patriotic fervour, moral texture and motivated and highly dedicated citizens. Indeed, if and when the history of freedom struggle comes to be written in all its splendour, one would realize the yeoman service these colleges rendered.

It may be noticed from Table I that, until 1983, there has been expansion only in Arts, Science and Commerce with practically no growth in professional faculties such as Engineering, Medicine etc. However, suddenly in 1983, the Government of Maharashtra,

allowed sixteen engineering colleges to be opened within the jurisdiction of the University of Poona. Although the growth in engineering educational facilities was very necessary, the sudden opening of new colleges has given rise to a large number of problems.

It must, however, be mentioned that some of the recently opened colleges are highly enterprising and have done excellent work in relation to adult education, continuing education, rural development etc. These colleges have not only received acclaim locally but also at the national level.

The University undertakes periodic critical analysis of the situation in relation to the affiliated colleges and takes corrective steps. Some of these are stated below :

(1) The student enrolment has exponentially increased over the last decade and half. The doubling period of enrolment and the associated activities is roughly seven years. If this rate of growth continues, which the present conditions indicate that it may, then the enrolment by the end of the decade will be about 2,50,000 and by the end of the century, the enrolment may go upto 400,000. This exponential growth in the number of students without proportionate increase in resources—human and material, must be viewed with concern. It is almost certain that by the expansion of the conventional system i.e formal education, opening of new colleges etc, it will not be possible to provide the students with quality education. It is our conviction and firm belief that it will become increasingly necessary to introduce and expand the system of non-formal education using modern electronic media such as the radio, television etc.

In order to partially solve this problem, the University has thought of introducing what we call Media Mediated Education. This involves getting audio and video lecture tapes prepared by eminent teachers in the University and Colleges. A set of lecture tapes would cover the entire syllabus of a given course. These lecture tapes would be duplicated and provided to the colleges. It is proposed to establish a library of tapes in every college. Through these tapes, it would be possible to provide quality education to students in distant and remote areas. In a sense; it will make available to every student the facility of listening to a best teacher in the University. The scheme does not totally dispense with a teacher but what is proposed in the scheme is to nominate one of the competent teachers to be a consultant to whom students could go to, to seek clarification or to

solve their difficulties after seeing the video tape on the television screen. This will not only enrich the formal education but will also provide facilities to learn while serving or carrying out a profession or an avocation. By implication, the system also provides for teacher training because the young and inexperienced teachers would learn on seeing the tapes as to how lectures could be given.

(2) Many of the colleges particularly in the mofsil areas do not have adequately qualified staff, equipped laboratories and libraries. Efforts are being made to strengthen these colleges. One of the approaches that is being followed to strengthen the existing system is in relation to orientation and refresher courses for college teachers. It has been decided that every new teacher either in a college or in the University must undergo an orientation course, whereas the older teachers be provided with an opportunity to refresh themselves every third year. Such orientation and refresher courses have been conducted by the University for the last two years and the results are encouraging. The University Grants Commission have now approved of our proposal to establish a Staff Academy for such orientation and refresher courses.

(3) As stated earlier some of the affiliated colleges are well established have a good standing and are progressive. In the monolithic system of affiliated colleges all the colleges with varying degree of attainment and standing are all bound together to follow the same syllabi follow the same system of evaluation, etc. This stifles initiative and does not allow any new and innovative programmes to be undertaken. In order to allow flexibility in the system and give freedom to teachers to initiate novel programmes of education and evaluation, the University is proposing to give autonomy to some of the developed colleges.

(4) Some efforts are being made to pool resources on the district level to provide postgraduate education in some subjects.

(5) Undergraduate teaching programmes in the country have become stereotyped and somewhat irrelevant. There is no correlation with what the boy learns and what he is expected to do or will be called upon to do in life. All the students go through the same course which has a heavy bias on storing uncorrelated information. The University, therefore, decided to restructure the courses at the undergraduate level. This University with the help of the UGC undertook a pioneering step in this regard a few years ago.

The restructured course unlike the conventional courses has the following components : (a) a foundation course, (b) conventional disciplinary course, (c) applied course dealing with practical applications of the knowledge the student acquires in the conventional courses (d) project work or field work, and (e) personality development courses such as NCC, NSS etc. The aim of restructuring is to develop the total personality of the student by imparting knowledge, developing skills and attitudes and promoting initiative as well as promoting socially relevant work. These restructured courses have been introduced in seven colleges as a pilot experiment. This experiment has been hailed at the UGC and it is suggested that we may expand this programme to include other colleges.

(6) The University has undertaken another pioneering experiment and that is to decentralize the University administration by creating district sub-centres.

(7) The University continually tries to update existing courses and to introduce new courses at the undergraduate level. Looking at the deep inroads which electronics is making in every branch of human activity, the University introduced electronics as a subject on par with Physics, Chemistry etc at the undergraduate level. The University trained the teachers developed and produced experimental kits for the colleges. This course has been very popular.

The University designed a new course leading to Bachelor in Computer Science which was introduced in some select colleges. This integrated Bachelor in Computer Science course has become very popular. The University is also planning to introduce an integrated course in Bachelor in Life Sciences.

(8) In an effort to diversify educational programme at the undergraduate level and make education more relevant and meaningful, the University has developed a concept of community college. The community colleges are expected to train students to serve the specific needs of the community in which it operates and in turn draw its sustenance and support from the surrounding community.

(9) The University has also undertaken pioneering step to introduce a large number of training programmes leading to certificates and diplomas. The University carried out a detailed survey of the industrial infrastructure in and around Poona. The Univer-

sity has also worked out an employment opportunity profile afforded by some 5500 small-scale units and 180 large and medium scale industries. In addition, the University has introduced courses such as B.Sc. (Applied) in electronics, computers, environment, hospital management, etc. These training programmes are highly popular and supplement the conventional and broad-based educational programme.

Examination Reforms

In the opinion of the University, evaluation should form an integral part of the educational process. The University established, with the assistance of the University Grants Commission, an Examination Reforms Cell. Various progressive steps have been taken by the Examination Reforms Cell. The most important being detailing and amplifying the syllabi and preparation of question banks. Until recently, there was a stipulation that 50% of the questions in the actual examination should necessarily be from the question bank. However, last year it was decided that question banks should serve as an aid to the process of education and not a constraint on the examination.

The University introduced a system of Central Assessment in which examination papers for a given examination are assessed at one place by a number of examiners after jointly analysing the question paper and rationalizing the process of evaluation.

Only last year, the Examination Reforms Cell embarked on a novel experiment. The present examination system has essentially two drawbacks and these are: (1) the system lays too much importance on memory rather than on understanding, and (2) the system of evaluation is highly subjective. The Examination Reforms Cell identified the various qualities for which the students need to be evaluated. These are (1) capacity to analyse situation, (b) comprehension, (c) logic and reasoning, (d) memory, (e) innovativeness and model building capacity, and (f) communication skill. The examination papers were set in each subject to test these qualities. Such an examination provides a complete profile of the students. Some students are highly innovative but are weak on memory. Unfortunately, the present system of examination which lays great emphasis on memory weeds out the innovation for such innovative boys and girls who are weak on memory. The University is exploring the possibility of introducing this new system in some examinations.

Fine and Performing Arts

This part of the country has a very rich tradition in music, dance and drama. Marathi stage is highly

developed because of the contributions of a large number of artists like Bal Gandharva, Hirabai Badodekar, Jyotsna Bhole, Bhalji Pendharkar and several others. Through a course of dialogue between such eminent artists like Pandit Bhimsen Joshi, Jitendra Abhisheki, Rohini Bhate, Jyotsna Bhole, Jayram Shiledar and others, it was suggested that University should introduce courses in music, dance and drama. These courses have recently been started under the guidance of these eminent men and women. In these courses, emphasis is laid on performance and practical training and both these are being carried out in accordance with the ancient Guru-Shishya Parampara.

Adult Education

The University is very actively participating in National Adult Education Programme carried out through 1,000 centres operated through the help of affiliated colleges. The work of these centres has been applauded all over the country. Similarly, University has taken a leading role in preparing material for educating the adult and in using modern electronic media such as the radio and television for eradication of illiteracy.

Sports and Corporate Life in the University

While advancing the frontiers of knowledge and applying the known and the acquired knowledge to solve the perceived problems of the society, the University attempts to promote corporate life by promoting sports and cultural activities. Our sports facilities are awfully inadequate. However, with borrowed facilities, our students have performed extremely well on the sports field and athletic ground. They have won several championship in Inter University tournaments, participated in national and international competitions. This University has been adjudged on the basis of its performances as the THIRD amongst some 170 and odd universities. The University has planned, in collaboration with local industries and philanthropists, a Sports Complex and it is hoped that our dreams will soon become a reality.

Hope and Dedication

The University of Poona is marching ahead on all fronts and developing rapidly and yet there is long way to go to become a centre of learning comparable to the best anywhere in the world. Although we are happy at the progress, we realise that there is no room for complacency. However, given the support of the society, the dedicated efforts of the faculty to excel and the motivation of the students, we have every hope that we will be able to march ahead towards excellence. □

EDUCATION AND DEVELOPMENT THE INDIAN EXPERIENCE

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Ansari M M, *Education and Economic Development*, Association of Indian Universities,
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Planning of education as a facet of economic growth was one of the important policy objectives which received particular emphasis in many countries from the beginning of the sixties. Till late fifties, physical capital was considered as the key button which, if pressed hard enough would set in motion the economic process, which would result in raising the future output. Although the demand for education was strong and the spread of education was thought to be an index of social advance most governments had as yet no specific conception of the relation between education and development. As a result, allocations to education proved to be difficult to decide upon in any rational and consistent way.

A series of empirical studies carried out in early sixties on the nature and causes of economic growth over a long historical period in highly developed countries revealed that in reality, physical investment accounted for only a part of economic growth. If the growth of national product over a (long) period is such that physical capital alone does not account for the whole increase, the remainder or residual must be due to a variety of other factors. Although varying estimates were made by different economists about the components of the residual factor in economic growth it was broadly accepted that a substantial portion of it could be accounted for in terms of a rise in productivity which in turn, was due to improvements in knowledge, skills and capacities of the people. Thus the attempts to explain the residual ended up in discovering that upgrading of human resources through education could have long-run favourable effects on the efficiency of human beings as productive agents, and that expenditure on education is analogous to investment in physical capital. By late 1960s, there was a general agreement among economists, educationists, politicians and planners that education was a key

change agent for moving countries along the development continuum. A literate and educated population was regarded not only more productive but also desirable. To tolerate illiteracy and under-education was to tolerate wastage of human talent potentially available for society's benefit. The post World War II development of Japan and Germany was generally regarded as the classic example of education being deliberately utilised as a contributory factor to economic and social development.

When poor countries enter upon the process of developing their agriculture and industry, it was argued, there is a tendency to invest too little in human capital relative to what they invest in non-human capital. Skills and knowledge useful in their economic endeavour or, in other words the human dimensions of development, get neglected. These countries should therefore, regard most of their outlay on education as an investment since economic development must be even more important for them than the advanced ones. It was also pointed out that it is in countries with a high degree of education that there is a readiness to accept change and development that are appropriate to a modern economy. Education enhanced man's capacity to absorb, diffuse and utilise new knowledge and is the basic key that unlocked the door to productivity.

The upshot of all this was a clear pointer to laying greater emphasis on raising the educational level of the people in many developing countries. Education was no longer considered a 'luxury', or a privilege and pleasure of the elite, or the private concern of individuals or parents, it was accepted as the collective responsibility of the community. A new horizon in the concept of capital and the possibility of using investment in education as a parameter of growth instead of allocating resources to the sector of education on a residual basis, as had hitherto been the practice, was opened. Also the concept of education as an invest-

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...ent creating human resources for development emerged at a time when the idea of planning gained considerable ground in many less-developed countries. There came into vogue the integration of educational planning (or broadly human resources planning) with the overall planning.

The Educational Options

What are the priorities among the educational options as far as less-developed countries are concerned, and has India been able to use education as a vehicle of economic development?

(a) Illiteracy is the real stumbling block in the way of economic progress in the less-developed countries, and hence priority should naturally be given to universal elementary education. The highest social rate of return, as many studies reveal, is to be had from additional investment in elementary education, mainly from completing the fifth to the last elementary year. This high return relative to secondary and higher education is sufficient justification for renewed emphasis on development of this level of education.

The strategy adopted by many developed countries, in their earlier stages of development, was to build their educational structure block by block, upwards from the foundation. Their first goal was the attainment of universal elementary education, meanwhile building a modest core of secondary and higher education. After reaching the stage of universal elementary education, a more generous attitude towards secondary education was taken meanwhile keeping higher education still tightly under control. Only when secondary education had become almost universal, they went about transforming their narrow or elitist system of higher education into a mass one. Once a country reaches a desirable level of education at lower levels, the expansion possibilities naturally are only in the higher stages, and that is what is being witnessed in the developed countries.

If a developing country desires that its educational system should become the handmaiden of economic development, it should first concentrate on the base of the education system, i.e. elementary education. Giving an important place to this level of education by upgrading resources to it is well-justified. The provision of minimum education and functional literacy to all promotes significant behavioural and attitudinal changes at the level of both the individual and the community which are very essential in the process of economic development, especially in low

income countries. The experience especially of Japan and many socialist countries shows that literacy by itself can contribute a great deal to self-development, and provide the necessary basis for human resources development. Adam Smith, Alfred Marshall and many other earlier economists had insisted on the importance of education in the formation of human capital and the decisive nature of the latter in the working of the economic system. Smith had stated long ago that by providing education of an 'elementary' type to the mass of the people, the State could derive no inconsiderable advantage. Although it would entail some cost to the Public Exchequer, it would, according to him, surely repay that with a profit. "The more they are instructed" said Smith, "the less they are subject to delusions of enthusiasm and superstitions, which among ignorant nations, frequently occasion the most dreadful disorders. An instructed and intelligent people, besides, are always more decent and orderly than an ignorant and stupid ones..... They are more disposed to examine, and more capable of seeing through, the interested complaints of faction and sedition and they are, upon that account, less apt to be misled into any wanton or unnecessary opposition to the measures of Government". Thus he who was against State intervention in personal and social life, except in certain well-defined spheres, had observed that education (of an elementary type) was one area where the State should intervene with finance because it developed not only 'aptitudes' but also 'attitudes' conducive to economic progress. Its priority followed naturally from the assumption that it was regarded as a matter of national concern undertaken in the interest of the community as a whole.

A minimum literacy rate of 40 per cent is considered as necessary but not a sufficient condition for a sustained level of economic growth. However, it is contended further that industrialisation and more rapid economic expansion cannot occur until 70-80 per cent of any population is literate. To this extent it seems that at least for a certain level of economic development, a fairly high level of literacy is required. (Fagerlind and Saha 1983).

(b) Since education is looked upon as a kind of economic and social equaliser, as it expands, it should be availed of by all classes of people. The whole concept of education for the elite will have to undergo a change and replaced by the concept of education for all. If the goal of education for all has to be attained, efforts will have to be directed upon enlarging the intake of lower income children (especially from the

rural areas of the country) and bringing down the tremendous wastage on account of 'dropouts'. The internal efficiency of school investment process also tends to the highest when the dropout rate is near zero.

Since the main reason for the high dropout rates (and children not joining schools at all) could be the poverty of vast majority of the population, a real solution to it would, therefore, be taking some positive steps to alleviate the economic disadvantages of children/parents who find it difficult to avail of the educational opportunities. External inequality does find its way into the school. Besides this, the universal access to education should be organized in such a way as would equalise education in terms of quality. Only this way school can be made an agent for reducing social economic inequalities. If better education is offered only to those with most economic social privileges, the inequalities will get accentuated.

(c) Just a large increase in facilities for elementary education may not be enough; the education provided should be of good quality. The expansion of bad education can only be counterproductive. It has also to be intimately related to real life situations—local, cultural, economic, etc. and the problems people daily encounter. Attention needs to be focussed much more fundamentally on what is taught, and how it is taught, in order to promote economic development. The curriculum should be such that it generates among the students a positive attitude towards life and work, which certainly has economic significance. When what is taught is of doubtful value (or even disvalue), there would be little point in arguing about its equal distribution or its contribution to economic growth. The proper implementation of the programme of universal elementary education of quality will also need immense academic inputs in terms of organisation of a large band of efficient and well trained full time as well as part time teachers, new teaching and learning materials, the creation of a highly decentralised system of administrative and financial support, etc. These educational programmes need to be carefully monitored and evaluated.

(d) Extending the level of facilities for education among all regions and in all parts of a region equitably also form one of the main objectives of public expenditure on education. More institutions need to be provided especially in rural backward areas and serious efforts be made to upgrade those of poor quality already established there so that they can attract more pupils from these areas. In many

advanced countries, extension of appropriate educational facilities into the remote parts was one of the important accomplishments in the early stages of their economic development. Some developing countries like China and Cuba have also succeeded in this and their literacy rates have naturally gone up. Adequate community support was also forthcoming in implementing these tasks. (In India, in the State of Kerala studies have shown that the existence of a community based, voluntary and non governmental sector for providing education at various levels and a network of roads linking rural and urban areas acted as a major determinant of the high rates of enrolment and retention in primary schools and of literacy).

(e) According to Schultz, when account is taken of the benefits bestowed on the next generation, the highest social rates of return are to be had in developing countries from investment in the education of females and therefore this should be placed high on the agenda. In developed countries almost virtual parity has been attained between male and female participation (Schultz, 1972). Women, Schultz adds, play an important role in 'intergenerational' transfer of acquired ability in a family. The educational attainment of the mother is among the most important determinants of a child's future and economic success; the child, in such an environment, receives a 'head start'. Even if some of them (women) are forced to withdraw from the labour market to devote themselves to their families thus depriving society of the benefit of certain 'externalities' which education might generate, these must be set off against the intergenerational externalities which may be generated by them within the family. "If the greatest single obstacle to improvement in general living conditions is the continuing population growth, and if the social economic and educational status of women significantly affects fertility levels, then the educational opportunities available to women are of crucial importance" (World Bank, 1980).

(f) Although investment in human capital (by way of education) enhances the future economic well-being of a developing country, the 'pay off' from that investment depends upon the active setting of 'successful development' within which "the additional skills and abilities associated with more education are in demand and the rates of return to the investment in them become as favourable as the best investment opportunities" (Schultz, 1972). If a growing proportion of the school leavers and graduates are not assured of employment, or appropriate employment, the investment in the educational system will be

an investment in idle human resources. Under such a situation, further rapid expansion of secondary/higher levels without efforts to create meaningful employment opportunities will prove to be self-defeating and a drag on the economic system. There has, therefore, to be a proper linkage between education, employment and economic policies.

(g) Since qualitative improvements in education constitute the essence of human resources development, greater attention will have to be given to this aspect. Quality should not become a casualty in the process of expansion of education. If it does, it will be really bad—especially when international competitive forces in skill-oriented activities (originating from advanced countries) are operating at full swing. Education, especially at higher levels, will be required to acquire a new role in response to the knowledge explosion in all fields. While framing the course contents, efforts should be made to move forwards, and not to slide back. Educational planning can be meaningful only when the policy makers spell out clearly the qualitative aspects. They should also indicate how, or the manner in which, excellence can be achieved, and the priority that should be accorded to it within the resources available.

The pay off from investment on education depends upon conformity of the various points mentioned above in the case of less-developed countries. The advanced countries have been successful in achieving rapid economic development by raising the educational level of their people because it took place under the above setting wherein results could be achieved. These are important factors and need to be given careful thought while planning for education in the less-developed countries. The basic mistake in the approach India adopted was that it sidetracked or ignored these stipulations. That is the reason why education is not producing that kind of a miracle, or higher economic growth, as was expected of it. The situation, evidently, calls for radical changes.

II

Literacy : Failure to Take Off

The most glaring failure of the Indian education system is evidenced in the poor literacy rates. This has left a deep scar on the nation. The Education Commission, which had looked at the problems of Indian education in a comprehensive manner, had warned as long back as in 1966 that

“the existence of the vast masses of non-literate

people in our country, which prides itself on its noble traditions of learning, is humiliating.... An effort commensurate with the magnitude of the task of eradication of illiteracy is inconceivable unless there is a clear conviction on the part of the national leadership that the education of the masses of non-literates has a direct bearing on economic and social progress and on the quality of national life... We think that the problem must be faced resolutely, and realistically, and we are convinced that indifference to it will not remain unpunished.”

The recommendations of the Commission were however not headed to and the struggle against illiteracy lost its urgency.

India had 300 million illiterates in 1951; the number in 1981 was around 437 million—with Uttar Pradesh accounting for more than 80 million followed by Bihar with 50 million. Although the percentage of literacy improved from 16.6 per cent to 36.2 per cent between 1951 and 1981, in absolute numbers the total illiterate population has grown. The most crucial segment of the population from the point of view of the ‘quality’ of future generation is women, but against the national average of literacy of 36.2 per cent, the rate among women was just 24.8 per cent in 1981. The situation is serious in rural India where the literacy rate is just 29.7 per cent (and among women still lower, being only 18 per cent). This underlines the magnitude of the problem and the efforts that are required to be mounted. According to the World Bank estimates, India will have the dubious distinction of having the largest concentration of illiterate population in the world by the turn of the century—500 million—and this will constitute a little over half of the world’s illiterate population (currently it is one third). Among the 34 countries in the low income group, the literacy rate in India is just 36 per cent as against 58 per cent for the group.

India has a long way to go towards the fulfilment of the constitutional directive of providing free and compulsory education upto the age of 14 (the dropouts at this level are also enormous representing a wastage of precious resources). The country is already 28 years behind the time stipulated in the Constitution (i.e. 1960) on achieving this aim. Still more serious is the neglect of adult education which is particularly important in a less-developed country. And it is needed all the more in order to make elementary schooling more effective since the dropouts are more common in illiterate surroundings.

The problems faced in higher education are precisely the opposite of those faced in lower levels of education, especially at the elementary level. There is no question here of inadequacy or slow growth, on the other hand the entire sector of higher education has experienced unplanned expansion—without taking into account, in quantitative and qualitative terms, the manpower requirements for achieving a specific level of development. Insofar as it raises demand to levels inconsistent with labour market situations, its positive contribution to productivity is doubtful. The importance of the people as a resource can be enhanced only when they are active participants in the development process. As observed by Peter Drucker, the human being becomes a resource only if trained, developed and allocated to productive work. Little constructive effort has been made either to tackle the problem of educated unemployed or to reorient higher education to suit the needs of the economy.

There has no doubt been a rise in the proportionate share of higher education (accounting now for nearly 30 per cent) in total (recurring) expenditure on education, but it loses much of its significance when it is seen in the qualitative context. With enrolments rising faster and costs escalating, there is a dilution of per pupil expenditure leading to a sharp slump in academic standards. The funds are too thinly spread over too large a number (and area), and hence just not adequate. The paucity of funds has precluded the possibility of developing a system of higher education best suited to the genius of the people and the development of the country. It has forced the institutions to cut expenditures on many ongoing programmes—and the axe has fallen more on programmes that have high academic value especially pertaining to professional technical education. A higher education system which shuns the pursuit of excellence will only take the country to mediocrity and stagnation.

Another disturbing feature is that the spread of facilities for higher education has been rather uneven in the country. There is a lack of harmony between Central agencies (including the UGC), on the one hand, and the State Governments, on the other, with regard to the growth and financing of higher education (as revealed in a study conducted by this writer in the Bombay University recently). Also the bureaucratisation and lack of dynamism, both at governmental and institutional levels are hard to deny. Their capacity to change is slight, sometimes non-existent.

An Important Contribution

Ansari's study *Educational and Economic Development* could not have been brought out at a more appropriate time. This well documented Study pinpoints some of the major shortcomings facing the educational system in the country today which have impeded the rate of economic growth: (1) the failure to make a deep impact in the area of literacy, particularly among females, (2) non achievement of universal primary education, and lack of incentives to attract and retain children especially from the lower income groups, (3) the failure to ensure equity in extending educational services across the regions as well as various socio economic groups of the people, (4) fast deterioration in quality as well as irrelevance of course contents to the socio-economic needs of the country, (5) inadequacy of facilities for education in general and elementary education, in particular, and (6) poor linkage between education employment-economic policy. The author traces the under-performance of the education system in the above mentioned areas to lack of political will and therefore inadequate allocation of resources to education.

The study seeks to examine the treatment given to education since the inception of planning. The author has analysed the influence of educational variables on selected indicators of development in the Indian context, and on the basis of such relationships, has tried to highlight the importance of education to social and economic development. According to him, insufficient attention to universalisation of elementary education and eradication of illiteracy—especially among those living in abject poverty—could be said to be responsible to a significant extent, for poor performance of national economy during the past three decades. In view of the dominance of agricultural sector in the national economy (in terms of both income generation as well as absorption of work force) one of the strategies of development should have been to improve the levels of enrolment and retention of students at the elementary stage of education so as to ensure that all the labour intensive sectors, like agriculture, agro-based industries and other small scale industrial units were provided with more literate and skilled workers. (p. 20)

The study draws attention to the fast decline in financial allocation for education and calls for a deeper, more generous commitment to education. It also grapples with the task of comprehending the

linkage between illiteracy and poverty. In short, the inadequate, inequitable, dysfunctional and disoriented nature of the existing educational system stands revealed in the study.

The paradox of the existence of a large number of illiterates and educated unemployed, which is an indication of an unhealthy economy and social tensions, has been well brought out. A long term education policy to deal appropriately with such problems is therefore indispensable, according to the author. The author has come out with some policy measures for effective utilisation and development of human resources through appropriate manpower planning which is in consonance with economic planning. He has pleaded for better labour absorption policies to minimise the problem of educated unemployment and associated economic losses.

Resource Crunch

Indian education is beset with major problems whose solution will surely require greater exertions—and these problems loom larger as the country has to enter more advanced stages of socio-economic development. Hence the need for a change can no longer be seriously disputed. What is becoming more evident is the serious resource crunch. The financial implications of enrolment of education, as projected by the UNESCO for 1985—goals that scarcely provided universal basic education—are that the GNP of developing countries like India should grow at least 7 per cent a year to keep the share of education at 1975 levels. The recent trends in the average annual rate of growth of GNP in India show that it is not even 4 per cent. Expressed as a percentage of the GNP, the expenditure on education rose from 1.3 in 1950-51, to 2.6 in 1960-61, and to about 3.5 per cent in 1985-86. This compares unfavourably with the corresponding figures in some advanced countries like the U.S.A., the U.S.S.R., Canada, Japan, the U.K., France, etc., and even some developing countries, where it ranges between 6 and 8 per cent. The disparity is quite large. The Education Commission (1964-66) had recommended that the expenditure on education in India, in terms of percentage of national income, should be raised to 6 per cent by 1985-86 but the country is far behind this target. Considering India's population, the level of investment on education is shockingly low. An analysis of the behaviour of the Five-Year Plan developmental expenditure also shows that although the Plan allocation on Education increased from Rs. 153 crores in the First to Rs. 2524 crores in the Sixth Plan, the share of the

educational sector in total Plan outlay has consistently declined—from 7.9 per cent in the First to 2.8 per cent in the Sixth Plan. Education has got a very low priority in the development spectrum, though it is a vital sector. Dr. V.K.R.V. Rao, in this context, poses a question: "Why people who so readily recognize the superiority of modern techniques in industry or agriculture and are willing to find large funds that its adoption necessitates, are so blind as not to see the relevance of the extension of this attitude to education, which after all is one of our major forms of investment for economic development?" (Rao, V.K.R.V., 1966).

There is perhaps no sector of national activity where the Government—both at Centre and the State level—has dragged its feet as in education. In fact, recourse to cut in investment on education was most often taken to counteract short-run economic fluctuations. Whenever the government budgets went away, educational schemes invariably were the first casualty of the cuts. Such short term objectives of financial policy were also proving to be detrimental to the longterm development and implementation of many decisions to which the Centre/States were already committed. Even the funds allotted to education were not fully used in some States or diverted to other sectors of State expenditure (The State of Kerala, however, is an exception to the above rule. Despite its relatively low per capita income, this State could march ahead in educational development. Here, it has to be noted, private initiative played a significant role). Education for the weaker sections continue to be regarded by many State Governments as an activity deserving only the 'left over' funds, although it is those at the base of the socio-economic pyramid who pay a sizeable share of taxes (raised mostly through indirect taxes which impinge more on the vast mass of the poor) that goes to subsidize the education of the privileged who occupy the apex and get the best and highest paying jobs (Coombs, 1985). Much of the above problems arose in the past because education was a State subject—till the 42nd Amendment was adopted in 1976, the Centre had no *locus standi* in the matter except to determine and coordinate standards in respect of higher education. Education was however included in the Concurrent List in 1976, but there has been little follow-up action. According to Sharma, "the dilemma of the education system has been that owing to economic and social development the demand of and expectations from the education system (at all levels), both in terms of quantity and quality, have increased, but the resources made available to the education system, particularly after it is

brought under the Concurrent List, has been squeezed successively. In this squeeze, the lead role has been played by the federal government and, amazingly, the federal government has also played a lead role in making the case for improvement and development of the education system." (Sharma, G.D., 1986).

Ansari is right in saying that "the approach to development planning has suffered owing to lack of proper conceptualization of the role of education in creating conditions for national progress" or, in other words, failure to understand the intimate connection between educational reconstruction and economic development. If the Government is sincere in its desire to take India to the 21st century, it will have to give a central place to education. It has adopted recently a National Education Policy (1986) followed by a Programme of Action for its implementation. One redeeming feature of the New Policy is that it treats education as a crucial area of human resource development. It is considered to be a condition not only for development but also for the survival of the nation and the individual. Also the Government has (again) committed itself to the main tasks of strengthening the base of the educational pyramid, i.e. elementary education, tackling the problem of adult illiteracy, expanding the provision for vocational education, etc. Many developing countries today appear to be veering round to the view that illiteracy is the real stumbling block in the way of economic growth; and hence priority should be given to universal primary education. Besides, as Ansari states, the quality of higher education also depends *inter alia* on the inputs of elementary education which unfortunately have not been paid due attention by the policy-makers (p. 39). The new thrust emphasises two aspects: (i) universal enrolment (and retention) of children upto 14 years of age, and (ii) a substantial improvement in quality. These efforts will be coordinated with a network of non-formal education. The implementation of this programme is the challenge of today and tomorrow. In fact, the shame of having kept 64 per cent of the people unlettered has to be shared not only by the Government but also by each one of those who have had the blessings of higher education.

All these changes, which the Government hopes to pursue simultaneously during the next few years, will assuredly entail enormous expenditure. Anyway, there is no disputing the fact that the crucial areas which need first and foremost attention are elementary and adult education so that illiteracy may be eradicated by 2000 A.D. No alibi like scarcity of funds should be allowed to hold back these programmes

because these represent the biggest, but long neglected, sectors and increases in allocations (as warranted by their requirements) have been stalled too long. These tasks have to be approached with an air of commitment seldom seen before. The battle against illiteracy can be the harbinger for economic, social and political stability, and most important, national solidarity. By all accounts, it should be waged as part of the anti-poverty campaign. It may be worthwhile quoting Ansari:

"The relative growth performance of the primary level of education has been significantly lower than other levels and that the low performance is owing mainly to the lack of adequate educational facilities and incentives to attract and retain the children, especially of poor families in the schools for sufficient number of years. This by itself recommends for a reasonably higher magnitude of investment on infrastructural facilities at the elementary stage of education. Moreover, the prevailing socio-economic conditions in the country heavily demand for speedy expansion of elementary education for the following reasons. Firstly, it is largely the children of poor families who have been deprived of the fruits of education. The fulfilment of the national desire for building up an egalitarian society, therefore, requires that due attention must be paid urgently to universalisation of elementary education. Secondly, the universalisation of primary education would undoubtedly enhance the socio-economic levels of the families which fall below the poverty line. Thirdly, since in all previous Five Year Plans the realization of targets has been lower than those originally set, the achievement of this objective by the year 1990, which has been presently fixed by the policy-makers, is seemingly difficult.... The target is not likely to be realised even by the year 2000 A.D., unless of course, the education policy lays heavy emphasis on implementation of educational programmes through appropriate strategies." (pp. 39-40).

As far as higher education is concerned, the Government intends taking steps to transform it into a vibrant one with a commitment to development and change. If this has to be fulfilled, the future policy must be related to changes of a qualitative nature, instead of quantitative expansion as in the past. This can be achieved through giving greater attention to real academic programmes, such as teaching/research, production of teaching/reading materials in sufficient numbers, teaching aids, libraries, laboratories, equip-

ments, etc. A higher outlay for these activities is imperative, but as Ansari anticipates, with the emergence of claims from other sub-sectors of education like elementary and adult education as well as vocational and professional education which have relatively been neglected for long, necessary finances may not be in the offing for higher education as compared to the pressure of demand. As evidences show, the lower levels of education are likely to get preferential treatment, while higher education will have to compete for public funds. (p. 45). In this context, a second look at the existing pattern of financing higher education, under which across-the-board subsidies are provided to all students, regardless of income or academic background, may be necessary. How justifiable is the existing liberal subsidy when (i) primary education whose provision affect the overall development of the society, is languishing for funds, and (ii) when there is a disproportionate number of students from the well-to-do families in colleges universities? According to Sen, there is an enormous amount of 'primary educational sacrifice' that is involved in the policy of faster expansion of higher education. "The right to higher education is the right of the educationally privileged to study further at the expense of the society irrespective of one's academic abilities, and it is a right that is exercised by throwing children out of schools" (Sen, Amartya, 1970). By enhancing fee rates—which have remained static for a long time at least for those categories of higher education wherein employment opportunities and private gains later are higher—there would not only be more resources to reinvest in the system but to extend financial assistance to students who really need and deserve it.

Conclusion

Ansari has done well by focussing attention as to how to make education a vehicle for economic and social change. It is a good piece of research work, with new dimensions, on a livewire issue. The Association of Indian Universities has brought out a number of useful studies in the area of Economics of Education, and this well-presented, well-documented work is indeed a useful and valuable addition to it. The slim volume provides enough food for thought to planners, policy makers and educationists. The reader will find it difficult to disagree with the author's findings/conclusions, the importance of which has increased further in the light of the new National Education Policy.

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Indira Kala Sangit Vishwavidyalaya

KHAIRAGARH (M.P.)

No. Gen 88

Dated the 12 May, 1988

ADMISSION NOTICE

Admission shall be made upto the 31st July, 1988, in the University Teaching Departments for prosecution of studies in Vocal Music, Instrumental Music (Sitar, Violin, Tabla, Sarod, Flute) Musicology, Folk Music, Sugam Sangit, Kathak Dance and Bharat Natyam Karnatak Music (Vocal, Violin), from Certificate Course to Post Graduate level courses. Bachelor and Post-Graduate Painting Courses and M.A. History of Indian Art & Culture are also available. For Foreign Students condensed courses have been framed. Separate arrangements for Girls Hostel available, Research Facilities for Ph.D./D.Mus. available with excellent library facility.

Application Form and Prospectus of General Information can be had on payment of Rs. 7/- by IPO or MO in favour of the Registrar. Few Scholarships on merit-cum-means basis are also available. One year Diploma Course in Folk Music for Basic Training school Teachers is also available.

M.K. Gungajaliwale
REGISTRAR

Group Discussion-cum-Orientation Programme on Financial Administration in Universities

University of Poona

June 6-10, 1988

PROGRAMME

Monday, June 6, 1988

- 9.00 a.m. Registration
- 9.30 a.m. Inaugural Session
Welcome
—Prof V.G. Bhide
Vice-Chancellor
University of Poona
- 9.40 a.m. Introductory Remarks
—Prof S.K. Agrawala
Secretary, AIU
- 9.50 a.m. Presidential Remarks
—Dr. P.V. Salvi
President, AIU
- 10.00 a.m. Key Note Address
—Dr. D.M. Nanjundappa
VC, Bangalore University
- 10.30 a.m. Vote of Thanks
—Shri Anjni Kumar

- 11.30 a.m. Introduction of the participants
& Preliminary discussions
- 2.30 p.m. Problems of Financial Management
—an Overview
Dr. V.R. Panchmukhi
- 5.00 p.m. Discussions & finalisation of
Group Report

Tuesday, June 7, 1988

- 9.00 a.m. Budgetary reforms—changing role of
budgets in Universities
—Dr. G.D. Sharma
- 11.30 a.m. Computers in financial accounting & man-
agement practices
—Dr. H.N.N. Murthy
- 2.30 p.m. Case study
Unadjusted Advances
Redesigning of Forms
—Shri Shital Prakash
- 5.00 p.m. Discussion & finalisation of
Group Report

Wednesday, June 8, 1988

Visit to Educational Institutions/Tata Manage-
ment Training Centre/Local Excursion

Thursday, June 9, 1988

- 9.00 a.m. Performance and zero base budgeting
—Dr. K.L. Handa
- 11.30 a.m. Effective utilization of resources in
New Education Policy
—Dr. K.L. Handa
- 2.30 p.m. Role of Computers in
University Administration
—Dr. S.C. Mehta
- 4.30 p.m. Managerial Effectiveness—
Role and functions of Finance Officer
—Dr. S. Neelamegham

Friday, June 10, 1988

- 9.00 a.m. Presentation of Group Reports & discussion
- 11.30 a.m. Formulation of recommendations
- 2.30 p.m. Valedictory function
—Welcome
Dr. S.N. Navalgundkar
Pro-Vice-Chancellor
University of Poona
—Address by Chief Guest
Shri J. Veera Raghavan
Secretary, Ministry of Human
Resource Development
—Concluding Remarks
Shri Anjni Kumar
Joint Secretary, AIU
—Vote of Thanks
Shri A.H. Thorat
Registrar, University of Poona

- Note :**
1. Every day in the morning from 6.30 a.m. to 7.30 a.m. arrangements will be made for yogic exercises;
 2. Film shows/Local visits may be arranged between 6 & 8 p.m. daily.

The Purpose of Education

"Character building is what I would consider as a prime objective of any educational programme. There is one aspect of character building which I feel has relevance in today's age and society. This is the inculcation of a value system that emphasises the pursuit of excellence, the nurturing of a scientific temper and developing a human approach to all aspects of our working life", said Dr M R Srinivasan, Chairman, Atomic Energy Commission and Secretary, Department of Atomic Energy, Government of India, while delivering the Convocation Address at the 78th Annual Convocation of the University of Poona. Excerpts

It is a cliché to state that education plays an important role in the all round development of a society. In reality, education in India has generally been treated as a means to obtain an academic qualification and thereafter a job or livelihood. Given the opportunities for employment or earning a livelihood in the country, one cannot blame the younger generation for adopting this approach. But I would request the young graduates to pause and ask themselves—is that all there is to one's education. The time we spend at school and college is no doubt to be spent in enlarging our academic knowledge. But more importantly it is also to learn about our role in society and to prepare us for a constructive participation in society. In this respect character building is what I would consider as a prime objective of any educational programme. There is one aspect of character building which I feel has relevance in today's age and society. This is the inculcation of a value system that emphasises the pursuit of excellence, the nurturing of a scientific temper and developing a human approach to all aspects of our working life.

I am aware of the increase in opportunities for higher learning

now existing in our universities thus obviating the need for moving to foreign universities. What is needed is to structure the type and nature of such higher education to fit into the ambit of national development to realise the hopes and aspirations of our people for a better tomorrow.

I cannot do better than to quote two important aims of this university which point in this direction. They are

- (1) While not losing sight of its essential character as a University i.e. a seat of universal learning which recognises no frontiers or barriers except those of the human mind itself, to keep in view the special needs interests and traditions of Maharashtra and its people and in particular its economic resources, its special problems of agriculture, industry and commerce and generally the various aspects of its economic and industrial life.
- (2) To diffuse widely the benefits of university education among all classes by

organizing centres of extramural teaching and university extension activity and encouraging the production of popular literature on scientific and cultural subjects.

The objectives then lead me to think of the means of its implementation. It is appropriate for us to remind ourselves of the oft quoted statement of the late President John F Kennedy "Ask not what not the country can do for you but what you can do for the country". This summarises the whole philosophy of the role of individuals and social groups in improving social awareness and implementing changes that are vital for protecting and preserving the bounties of nature and freeing humanity from the ills of society. We need to have a vigilant and vibrant force in the form of the young men and women such as those gathered here today to dedicate themselves to the conservation of the environment and ecosystems and to support national endeavours for eliminating poverty and improving the quality of life of our people.

While centres of excellence built around outstanding men are very important, in many fields of modern scientific endeavour, success is achieved through interactive efforts of large groups. The days ahead are for group achievements where the role of humanities and the social sciences is as important as the scientific and technical skills of the individuals in the group. I am aware of the joint TIFR/Physics Department programme run by the University and am glad that the GMRT Telescope project located close to the University will provide excellent opportunities for the students to work in the fundamental areas of astrophysics and cosmology.

In a recent interview Dr. Dhillon Ripley, a close friend of India and an associate and admirer of late Dr. Salim Ali has a word of advice to us to accept and adopt only those technologies of the developed countries which are appropriate to our needs and setting. In this context, he questions the suitability of adopting some of the agricultural practices suited for temperate climates to our environment and expresses the fear that it might even lead to problem of desertification of large tracts of land. This therefore leads to the conclusion that we should display originality in finding solutions to our problems and not merely be imitative.

Let me first tell you something about the organisation I come from, namely, the Department of Atomic Energy (DAE). Our work in the past three decades has placed India amongst a few select nations in the world that have developed expertise in a wide range of activities relating to the peaceful uses of nuclear energy. The management of science and technology in the DAE has been notable for the absence of bureaucratisation, freedom given to scientific workers to pursue their work without rules and regulations hampering them and a participative style of decision-making. A special feature has been the pursuit of excellence, ever since the organisation was founded more than three decades ago by late Dr. Homi J. Bhabha. Our effort has always been to attract the best talent, encourage and retain them so that they 'give their best in their respective fields. We endeavour to maintain an environment in which outstanding work is rewarded, where each person is treated as a human being who has his or her own problems, rather than as a cog in the wheel of a big machinery.

As an organisation working in a field that also concerns the public, we give due attention to environmental issues and allay public misgivings arising out of lack of information. We have also maintained a continuous interaction with the industry which has helped in the implementation of our programmes and which in turn has also enabled the upgradation of the general level of technology available with Indian Industry. Recognising the importance of electrical power for the country's economic development, DAE has taken up a nuclear power programme which aims at a generation capacity of 10000 MWe by the turn of the century. In the process of carrying out R & D in atomic energy, our scientists and technologists are working in some of the cutting edges of advanced technologies—like lasers, fusion, superconductivity, electronics, materials sciences, etc. These activities have led to several spin offs which have been transferred to industry so that the society as a whole benefits from our research and development programmes.

Coming from a scientific and technical organisation, I cannot help emphasising the role of Science and Technology (S & T) in our development. Despite the pessimism one often hears, we must realise that for a country which got its independence only 40 years ago, we have not done badly. Let us look at some basic facts: From being a chronic food importing country we have reached a stage when we could manage on our own, one of the worst droughts in history. There are also several quantitative indicators: Our gross national product and national income have multiplied nearly four fold, food production has gone up by 300%, industrial production by over 700% and electricity produc-

tion by an impressive 4000%. No doubt, many of these achievements have been overshadowed by a fast growing population. And further, one can always say that we could have done better. This is a healthy attitude and a good antidote to complacency. Impressive achievements come about only if we have in us the desire to excel in everything that we do in our day-to-day life.

I am laying stress on the pursuit of excellence for the simple reason that barring some exceptions, there is a tendency in our country to accept and be satisfied with the mediocre rather than strive for excellence. History has shown that development and prosperity in any society in the world has come about by the recognition given to excellence—in whatever field. This in turn requires each individual to demand the best of his or her ability in whatever activity one is engaged in.

Self reliance in technology is another ideal which I would commend to you youngmen and women. It calls for the assimilation of one's own areas of scientific and professional expertise as well as the recognition of the need to have it suitably meshed in with the achievements of others so as to produce strong linkages essential for them to be effective in overall technological advancement. It is then that innovation will result in the birth of new technology. The interaction between science, technology and industry is therefore necessary for reducing the gestation time in the conversion of a scientific principle into an object of public utility.

Today, most people recognise the fact that the significant achievements in India during the past four decades is in a large part attribut-

able to the emphasis placed on science and technology by the country's leaders ever since it got independence. This was contrary to the conventional wisdom prevailing at that time which felt that investment in science and technology would be a luxury for a developing country like India. But more important than achievements in science and technology per se is the need for developing a scientific temper amongst our citizens. This is easily said but in reality presents a major challenge. I recall a statement by Will Durant in his monumental 'History of Civilization' on the subject. He says, 'Religions are born and may die but superstition is immortal'. He goes on to add, "Only the fortunate can take life without mythology. Most of us suffer in body and soul and Nature's subtlest anodyne is a dose of the supernatural. This is not a feeling only of India but manifests in varying degrees in all societies. However, we seem to have more than our share of godmen, astrologers, fortune tellers etc. Even those who pursue science as a career are known to fall a prey to superstitions. Often we exhibit a tendency to jump to conclusions which are unduly biased by emotional considerations. We have to realise that there are many sides to any issue and balanced approach which involves some give and take is essential. One must objectively assess the pros and cons of any view point, weigh the priorities involved and arrive at workable solutions rather than argue endlessly and thereby expending only our energy. For a developing country which is desiring to enter the modern technological age, a scientific temper therefore becomes a pre requisite to ensure the success of any programme.

The rapid industrialisation of our country has brought in its wake

a migration of population from villages to towns and cities in search of employment. The villages are thus bereft of the young and the able bodied while the towns and cities have burst their seams for accommodating the large influx of population resulting in slums and the attendant socio economic problems. The quality of life of the people both in the villages and cities has thus suffered. We shall have to create large scale opportunities for employment in the rural sector and develop entrepreneurial skills there. We should also provide the benefits of modern science and technology such as improved telecommunication, better means of transportation and better health and educational facilities. Only then can the process of population migration to the cities be arrested. In all these programmes which involve large sections of population, the universities have a lead role to play in inculcating an appropriate value system amongst the student population.

As we develop into a technology oriented and a more industrialised society, we have to avoid some pitfalls in the process. We have seen elsewhere in the world how this has led to endless materialism accompanied by a trend to dehumanise all activities. In India, we have always had the tradition of being a human society. This has to be maintained. In concrete terms this would mean retaining the bonds of family, and concern for fellow citizens and for the future generations to come. We must address issues like environmental pollution, examine ways to conserve our natural resources and especially how to control the growth of our population. I would like to stress the imperative need of reaching a consensus in our society on the question of population control. Without it all the efforts

we are making at increasing the wealth of the nation for giving a better standard of life will be nullified by the addition of many more people to feed, clothe and shelter. In this respect we have much to learn from what China has done to bring down birth rates and they are already projecting a declining population trend commencing in the next ten or fifteen years. The over emphasis in recent times on materialistic needs has led to our best talent being devoted to science and technology. You will agree that it is very necessary that we nurture talents in the arts, literature, music, humanities, commerce, economics, philosophy, and a host of other disciplines that are essential to develop a humanistic society. I sincerely wish that some of the talented youngsters graduating out today devote their careers in these fields which have great relevance to the long term well being of our country. It would therefore be necessary for you to adopt a holistic approach rather than a compartmentalised one.

Many of you young men and women would also be aspiring to work in your respective fields in some of the leading institutions abroad and this quest for knowledge is to be accepted as a legitimate means of catching up with the rest of the world. Nonetheless it would perhaps be most laudable for all of them to have their sights on the needs of their motherland like the eagle which soars high in the sky but has its sight firmly on the ground looking for its prey. It will also be my desire to pass this message across to all those young men and women working and living abroad to come and participate in building up a prosperous India. □

National Conference on Role of Universities in Implementation of New Education Policy

UNIVERSITY NEWS SPECIAL ISSUE

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Problems of Hill Area Development

The Geographical Society of the North-Eastern Hill Region (India) and the Department of Geography, North-Eastern Hill University jointly organized a seminar on "Problems of Hill Area Development with Special Reference to the North Eastern Region" at NEHU, Shillong. Sponsored by the Indian Council of Social Science Research, North-Eastern Regional Centre and North-Eastern Hill University, Shillong, the seminar was inaugurated by Shri P A Sangma, Chief Minister, Meghalaya and was presided over by Prof R K Mishra, Vice-Chancellor, NEHU. Prof M Taher, Department of Geography, Gauhati University, delivered the keynote address.

Shri Sangma in his address emphasised the need for better data on land records and tenancy relations. He also stressed the need for greater interaction of the region with the rest of the country through proper development of transport and communication so vital to the integrity of the nation.

He said that the hill areas of the country had to face certain problems different from other areas inhibiting the process of development. Difficult terrain, variable agro-climatic conditions, distinct socio-cultural features had led to the backwardness of these areas and their slow pace of development. These areas therefore drew the special attention of the planners right from the inception of the plan era after Independence. The emphasis on hill area development emerged from the growing concern over inter-regional disparities and the disadvantaged hill people. It was realised that these areas in the country could not be developed in isolation from the adjoining plains

with which their economy was closely inter-linked.

Shri Sangma pointed out that in order to look into the problems, potential and strategy for development of the hill areas, various committees and task forces were set up by the Central Government. As a result of the findings of these committees, task forces and high-power groups, the Sixth and Seventh Five-Year Plan documents highlighted the problems of hill areas of the country and contained the special strategies covering linkages, infrastructural and organisational support, harmonisation of socio-economic growth with eco-restoration, eco-preservation and eco development, integrated watershed management with people's participation as the basis of hill areas development.

Describing the characteristics of the hill areas of the north east, Shri Sangma said that in recognition of the special characteristics and problems of these areas, the hill states of the North Eastern region along with some other states have been treated as special category states by the Government of India. Consequently, in determining the size of the Plans of these states, the Planning Commission gave emphasis on the actual developmental needs rather than the resource raising ability. Central assistance provided for the development of these states comes in the form of 90% grant and 10% loan.

While dwelling at length on the schemes for rural development, particularly poverty alleviation programmes drawn up on an all India pattern, Shri Sangma stressed the need for looking into local situations and local constraints and

adapting these schemes to suit the requirements of individual states. Agriculture was another area where it was necessary to look at the pattern of development, entirely different from the pattern fixed for the rest of the country. Discouraging the practice of jhum cultivation, he opined that the thrust in agricultural production in the hill areas ought to be on horticulture which, among other things, would be less damaging to the ecology of the region. He asked for evolving a strategy for the setting up of widely dispersed small processing units for the agricultural produce of the hill areas. Any serious plan for the development of agriculture in the hill areas needed a significant component of storage, processing and preservation of agro-horticultural produce, he added.

Referring to the chronic shortage of skilled manpower in the region, Shri Sangma said that emphasis had to shift from general education to vocationalisation of education. It was necessary to make use of the District Manpower planning and Employment Generation Councils to study the employment in the districts and to identify the requirements of different categories of manpower. He thought that greater stress could then be laid on setting up technical institutions which are more relevant to the hill areas.

Shri Sangma also emphasised that the development strategy for the hill areas should take into account the principle of integration of the ecological, economic and sociological coordinates.

Prof Mohammed Taher of the Department of Geography, Gauhati University in his keynote address presented an outline of the problems which the north eastern

region in general and the hill areas in particular were facing. He dwelt at length on the rugged topography of the north eastern region, about seventy per cent of which is covered by hills, mountains and plateaus. In spite of multifarious social and demographic developments in the region, the economic changes have been slow. With the help of data, he pointed out that the high rate of participation in work was not due to the capacity of the economy of the region, but a pathetic reflection of incapacity of the prevailing economy to generate surplus. Agriculture, with its meagre productivity, due mainly to the primitive methods of cultivation, engage about 32% of the total population of the region directly. He put the proportion of workers engaged in the secondary sector of industries in the hills at one per cent of the total population and that in the tertiary sector, especially in services, between 9 and 13 per cent. This state of economy of the region has resulted in a low per capita income of Rs. 911.00 as against Rs. 1163.00 of the nation (1980-81). He regretted the lack of infrastructural facilities in the region and stated that the hills region has a total available electric energy accounting for 0.34% of that of the nation.

Prof. Taher observed that it was in this physical, demographic and socio-economic background of the region, that measures are needed to be adopted for its all round development and the causes of failure to develop during the last four decades should help the scholars, administrators and planners to find out a workable methodology.

Over 30 participants from all over the country and 40 participants from Shillong and NEHU participated in the deliberations of the seminar which was spread over

five technical sessions. After the two days of deliberations, the following recommendations were made :

- (1) Land Records may be prepared specially in respect of registration of land on ownership basis consulting the village lyndohs, village mantris and village Durbers. These works should be preceded by a thorough cadastral survey of the entire region.
- (2) Levels of development may be assessed at a micro-level in different areas before suggesting developmental measures.
- (3) Fields cleared for shifting cultivation in a particular year should be replaced in a

the subsequent year by quick growing useful trees which after the jhum cycle can be used before clearing again for shifting.

- (4) Lack of infrastructural facilities specially in respect of transport and communication should be looked into and stress must be given for their quick development.
- (5) Village level social organisation should be formed to implement and look after all developmental programmes including IRDP.
- (6) The University and other research organizations should be associated in all developmental programmes.

Seminar on Autonomous Colleges

A two-day Seminar on Autonomous Colleges was held at the Gauhati University recently. Sponsored by the University Grants Commission (UGC), the Seminar was inaugurated by Prof. J.M. Choudhury, former, Vice-Chancellor, Gauhati University and was presided over by Prof. D.P. Barooah, Vice-Chancellor, Gauhati University Shri Kamaleswar Bora, Vice-Chancellor, Dibrugarh University and Dr. J.B. Ganguli, Vice-Chancellor, Tripura University also attended the Seminar.

The seminar focussed on (1) Scheme of Autonomous Colleges—Necessity, Objectives, Relationship with the parent University, Strategies for implementation of the scheme; (2) Programme of action of National Policy of Education relating to the development of Autonomous Colleges and Teachers' Training; and (3) Restructuring of Courses at the undergraduate level.

the revised U.G.C. guidelines for autonomous colleges and recommended to the Government of Assam, University Grants Commission and the Gauhati University authorities to take urgent steps in regard to following :

(1) To make suitable provision in the University Acts to enable the colleges and the University Departments to enjoy autonomous status on a selective basis, it being understood that the concept of autonomy and accountability implies that the autonomous units have the power of self-governance and decision-making in regard to academic programmes and administrative and financial matters.

(2) To take steps to formulate a scheme of incentives for University and college teachers as provided under 9(c) of the Plan of Action (POA) on National Policy of Education (NPE), 1986.

The seminar generally accepted

(3) To make provision for cent

percent financial assistance from the Central Government beyond a period of five years under the programme of autonomous colleges

(4) Having regard to the statement in POA (para 531), the present system of discrimination between the Central and the State Universities in allocation of funds should be eliminated. It was felt that to motivate the teachers of the colleges and the Universities the revised UGC pay scales for the teachers be implemented promptly. It was generally agreed that motivation of teachers is important for implementation of National Policy of Education in the field of Higher Education.

(5) To take steps for early setting up of State Council for Higher Education on the basis of the recommendations approved by the UGC

(6) To take urgent steps in restructuring the Courses at the undergraduate level and in this regard the seminar recommends the following subjects for consideration of the appropriate bodies. To start with only one subject be introduced in each college

Computer Science, Electronics, Bio Chemistry, Industrial Chemistry, Food Processing and Technology, Instrumentation techniques, Material Science, Forestry, Dairy farming, Petrochemicals, Land use techniques, Music, Dance and Drama, Book keeping and Accountancy, Photography, arts, potteries etc., Hotel Management, Journalism and Mass Communication, Automobile maintenance and repair, Population Education, Rural Banking, Co-operative Management, Entrepreneurship, Agriculture Marketing, Tourism, Environmental Studies, Nursing, Midwifery, Social Pathology, Physical Education, and Confectionery.

(7) To take immediate steps to introduce some of the application oriented subjects in permanently affiliated colleges from the next academic session.

(8) To take steps for intensive training for the Principals and academic staff of the concerned colleges selected for autonomy

(9) To provide for adequate funds for appointing additional staff for subjects introduced under restructuring of courses.

A number of Vice-Chancellors of the North Eastern Region local academicians, selected Principals of the affiliated Colleges of the region Principals and teachers of the local Colleges University teachers, State Government and University officials attended the seminar

Emerging Dimensions in Accounting & Auditing

The Faculty of Advanced Commerce Business and Industrial Management of Kanpur University organised a UGC sponsored National Seminar on **EMERGING DIMENSIONS IN ACCOUNTING & AUDITING** at the University recently. Besides the inaugural and valedictory sessions there were four technical sessions in which the following topics were discussed

Accounting and Auditing in the 21st Century Accounting Standards in India and abroad, From Statutory Audit to Management and Tax Audit, Management Control Systems and Accounting, Cash Flow Accounting, Accounting for Price Level Changes, and Professional Ethics and Hazards in Auditing.

The Seminar was inaugurated by Dr Gaur Hari Singhania Vice-

President of the J K Organisation, Kanpur and Dr. K B Agrawal, President of the UP Stock Exchange delivered the keynote address. The three-day seminar was presided over by the Vice-Chancellor Dr B N Asthana while Shri D N Dixit, Chairman and Managing Director of the British India Corporation delivered the valedictory address

The Seminar made a number of recommendations including the one suggesting setting up of a Kanpur Management Association

About 60 participants including those from Delhi University, Allahabad University, Jamia Millia, Aligarh Muslim University, and Institute of Chartered Accountants of India attended the Seminar at which over 35 papers were presented

OUAT Reports. . .

The Orissa University of Agriculture & Technology (OUAT) has introduced a degree course in Forestry, a Postgraduate diploma Courses in Computer Science and a diploma course in Sericulture. The University has also established a Video Project in collaboration with the Memorial University, Newfoundland, Canada, which will greatly help in the transfer of technology to farming community in their own environment

Under its literacy drive programme, the University has set up a Distance Education Programme for educating the semi-literate farmers on scientific farming through correspondence courses. So far, about 800 farmers have been enrolled for courses on different aspects of farming like Scientific method of groundnut production, rice cultivation, mushroom cultivation,

cattle management, vegetable production, etc.

With the financial assistance of Ford Foundation, farm research projects with Farm Science Research have started functioning in the State at Phulbani, Dhenkanal and Puri districts. This programme will provide need-based farming technology to small and marginal farmers dependant on rainfed rice-based farming systems.

Advances in Mathematical Techniques

A three-day All India Conference on Recent Advances in Mathematical Techniques and Applications-II was organised by Dr. Y.S. Parmar Institute of Mathematical

Sciences at Shimla from 18-20 May, 1988. Inaugurated by Shri Virbhadra Singh, the Chief Minister of Himachal Pradesh and attended by delegates from 18 states of India, Bangladesh and Nepal, the conference focussed on Bio-fluid Dynamics, Mathematical Physics, Mathematical Methods and Chaos, Stability and Turbulence. The conference resolved that more applicable mathematics such as used in Bio-Sciences, Medical Sciences, Social Sciences and in any other field to benefit the society be identified and attention paid to highlight it and train manpower to work in this field. It was also resolved that Dr. Y.S. Parmar Institute may act as the coordinating centre for this work.

Chancellor, who presided, disclosed that Sir Chhotu Ram Chair (Prof. of Eminence) in Agricultural Economics has been instituted at HAU and memorial lectures are delivered by eminent scientists, educationists, administrators in the broad field of agriculture and rural development on the occasion of birth anniversary of Deen Bandhu Sir Chhotu Ram.

New Oilseeds Varieties

The Indian Council of Agricultural Research (ICAR) has identified a number of new and high yielding varieties of different oilseed crops including sunflower, sesame and niger for the coming Kharif season. The varieties are sunflower, MSFH-17, a high-yielding hybrid for all sunflower growing areas except areas of Maharashtra infested with downy mildew; sesame, is five and RT-4N, all high-yielding strains with multiple tolerance to leaf curl, stem rot, bacterial ooze, gall fly, and niger CHH-1, RIDR-140 and GA-5, high-yielding and responding well to inputs and good crop management.

PAU Develops Gasifier System

The School of Energy Studies for Agriculture of the Punjab Agricultural University, has developed a 2 to 6 KW capacity gasifier system to operate on rice husk or groundnut shell. The producer gas generated by the system is used as a supplementary fuel in 7 hp diesel engine which can subsequently be connected to a pumping set or electric generator. While engine is operated on a dual fuel mode, about 75 per cent of energy is supplied by producer gas whereas the balance 25 per cent is met by diesel. Consumption of rice husk for a 7 hp engine is 6

News from Agril. Varsity

Rural Development and Eradication of Poverty

Sardar Tarlok Singh, former Member of Planning Commission delivered the Second Sir Chhotu Ram Memorial lecture at Haryana Agricultural University. "Intensive agriculture and intensive rural industrialisation, alongwith necessary social services and human resource development, adapted to the conditions of each region or area, hold the key to the development of agriculture and the eradication of poverty. They would also lead to expansion of employment, and productive use of the literate young men and women in the villages," observed Mr. Singh.

the major aims in view has remained unfulfilled".

The stagnation in agricultural production after 1983-84 and the severe drought which has prevailed over large areas in the country over the past year have created misgivings about the adequacy of current agricultural policies and programme. Any stagnation or decline in agricultural output deepens rural poverty, which continues to be a marked feature of the rural life of a large part of the country. He asked whether agricultural development programme reach out to the roots of poverty? Are they based on an adequate diagnosis of the nature of the problem of poverty? In adding expansion of employment to the alleviation of poverty, what new strategies do we envisage?

Dr. Har Swarup Singh, Vice-

He explained the major issues in agriculture planning, in relation to poverty, referring to small industries and said, "Most small industry has gone to metropolitan and industrial and urban centres and their rural spread has been exceedingly small. Therefore, one of

kg/hr. This range was selected because most of the farmers own 3 to 8 hp engine for various farm operations.

According to Professor A.P. Bhatnagar, Director of the School of Energy Studies for Agriculture, the application of this technology on large scale will reduce the dependence of the farmers on highly scarce and expensive petroleum fuel and would reduce the country's petroleum products import.

Sugarcane Crop Pests

The Entomologists of the Punjab Agricultural University have observed that under the prevailing hot and dry weather conditions, the attack of black-bug and mite on sugarcane crop is likely to increase in Punjab. Both these insects suck

cell sap from the plants. As a result of black-bug attack, the crop looks pale inspite of proper manuring and irrigation while in the case of mite attack, the leaves of the plant turn red.

To save the crop from the attack of black-bug, the experts have suggested to the farmers to spray their crop with 1.5 kg BHC 50 WP or 350 ml Thiodan 35 EC or 225 ml Sumithion/Pollithion/Accothion 50 EC or 350 ml of Dursban 20 EC in 150 litres of water. The spray material should be directed into the leaf whorl. In case of mite attack, the farmers are advised to spray their crop with 400 ml malathion 50 EC in 150 litres of water per acre. Since baru is an alternative host weed plant, from which the mites spread to the sugarcane crop, this weed should be destroyed.

Fellowships will be awarded for not more than three months' duration. Award would normally provide for economy or tourist class travel and a modest daily subsistence allowance but in no circumstances, would exceed a total of £2,000. The proposals by the member universities with necessary details should be addressed to Mr. P.B. Hetherington, Deputy Secretary General (Commonwealth Awards and Appointments), John Foster House, 36 Gordon Square, London WC1H 0PF.

Conference on Education and Development

An International Conference on Education and Development will be held in Manila, the Philippines from November 16-19, 1988. Jointly sponsored by the Southeast Asian Ministers of Education Organization Regional Center for Educational Innovation and Technology (SEAMEO/INNOTECH), the Southern Illinois University at Carbondale, and the University of South Carolina, the Conference will bring together leaders and practitioners in the field of educational development, rural education, distance learning and low-cost instructional programming. The Conference will explore potentialities and directions of education as a process in paving the way for material inputs and in supporting material development projects, to extend the benefits of development to much larger segments of target populations.

Details about the Conference can be had from :

INNOTECH Director,
P.O. Box 207,
University of Philippines,
Diliman, Quezon City,
Philippines.

OR

News from Abroad

Academic Exchange Fellowship Programme

Academic Exchange Fellowship Programme started by the Commonwealth Fund for Technical Cooperation aims at the promotion of academic movement amongst universities in the less developed countries of the Commonwealth to share with each other the fund of experience and expertise which has accrued among them. The programme, operated by the Association of Commonwealth Universities (ACU), may take any one of the following forms :

- (a) attachments of university staff, both academic and administrative, to other universities in Commonwealth developing countries

to obtain greater experience and training;

- (b) short study tours of university staff in Commonwealth developing countries to enhance their ability to contribute to national development
- (c) exchanges of staff between universities in developing countries with a specific developmental objective in view;
- (d) university-sponsored seminars with a national or regional developmental orientation, where support could be provided for organisation or for teachers or students to attend.

The Dean, School of Technical
Careers, Southern Illinois University
Carbondale
Illinois 62901, USA

Research and Training in Italian Laboratories

In pursuance of its aims to facilitate and promote mutual contacts between scientists in developing countries and those in industrialised countries and to further relations between their scientific institutions, the Third World Academy of Sciences (TWAS) awards grants to researchers of proven ability, working and living in developing countries, for the purpose of carrying out research, learning new techniques or undertaking some other form of training by working with colleagues in Italian Research Laboratories. A number of grants will be

awarded in 1988 in Biological Sciences, Chemical Sciences and Geological Sciences in which there is recognised Italian experience. Applicants should be nationals of developing countries normally with some research experience and with permanent positions at universities or research institutes in developing countries.

The scheme will cover living expenses in Italy and will amount to a minimum of Italian Lire 1,400,000 per month. Limited funds for travel expenses will be available in case these are not covered by other sources. The grants also cover health insurance for the visitors and their accompanying families. A monthly family allowance for those having dependent family members will be granted. Requests for application form as well as a list of

Italian laboratories may be made to :

Prof. M.G.K. Menon,
Vice-President, TWAS,
Yojana Bhawan,
New Delhi-110001.

Requests for participation should reach not later than 31 October, 1988 to the Executive Secretary, The Third World Academy of Sciences, C/o International Centre for Theoretical Physics (ICTP) P.O. Box 586-34100 Trieste-ITALY

We Congratulate ..

Dr. Nityananda Pattanaik who has taken over as Vice-Chancellor of the Orissa University of Agriculture and Technology, Bhubaneswar.

ANNAMALAI UNIVERSITY

ANNAMALAINAGAR

No. K2/7/88

Dated : 20.5.88

NOTIFICATION

Applications are invited for admission to the following courses for the academic year 1988-89.

1. M.P.E.S.
2. M.P.Ed.
3. M.Phil. in Physical Education.

The applications along with prospectus can be had from the REGISTRAR, ANNAMALAI UNIVERSITY, ANNAMALAINAGAR-608 002 on payment of Rs. 25/- in person or through a demand draft payable on Indian Bank or Bank of Madura at ANNAMALAINAGAR or State Bank of India at CHIDAMBARAM with a self-addressed envelope of size 30 cm. x 13 cm. and stamped to the value of Rs. 1.80 along with a requisition specifically stating the course for which the application is required. The application form together with the prospectus will be issued from 25th May 1988.

The last date for the receipt of filled in applications by the University is 30.6.88.

R. Rajamanickam
REGISTRAR

AIU Library & Documentation Services

One of the important functions of the Association of Indian Universities is to act as a clearing house of information on higher education in the country. Towards this end the AIU Library is engaged in collection building and developing instruments for the dissemination of research information. Over the years a valuable collection of books and documents on different aspects of higher education has been acquired.

The Library has also developed Bibliography of Doctoral Dissertations as an effective tool in the dissemination of research information. Retrospective bibliographies covering the period 1857-1970 and 1970-75 were the first to appear. Effective 1975, however, the bibliography is issued annually in two volumes. One volume deals with Natural and Applied Sciences while the other records doctoral degrees awarded in Social Sciences and the Humanities. In addition to the normal bibliographical details like the name of the Research Scholar, the title of the thesis, years of registration for and award of the degree, and the name of the University accepting the thesis for award of a doctoral degree, the bibliography also gives name and complete address of the supervising teacher and an availability note that seeks to inform whether a copy of the dissertation is available for consultation and use in the University Library/Department or Registrar's Office.

The columns 'Theses of the Month' and 'Research in Progress' are intended to cut out the time lag between the receipt of information and its inclusion in bibliography. Such Universities as are not sending us regular information in respect of Doctoral Theses accepted and research scholars enrolled are welcome to make use of these columns.

The Library is open from 9.00 a.m. to 5.30 p.m. Monday through Friday.

RESEARCH IN PROGRESS

A List of Research Scholars Registered for Doctoral Degrees of Indian Universities

PHYSICAL SCIENCES

Mathematics

1. Chandel, R.S. *Some problems in fixed point theory*. Devi Ahilya. Dr. Ashok Ganguly, Lecturer, Department of Mathematics, Shri G.S. Institute of Technology and Science, Indore.
2. Jadhav, B.P. *Problems in the non-Newtonian power-law fluids*. Shivaji. Dr. B.B. Waghmode, Reader, Department of Mathematics, Shivaji University, Kolhapur.
3. Sarachandran, T.G. *Semi groups*. Kerala. Dr. S. Madhavan, Prof., Department of Mathematics, University of Kerala, Trivandrum.

Statistics

1. Apte, N.S. *Ranking and selection of populations in binary response models*. Shivaji. Dr. M.S. Prasad, Prof. and Head, Department of Statistics, Shivaji University, Kolhapur.
2. Huggi, M.R. *Optimal confidence procedures*. Shivaji. Dr. R.N. Rattihalli, Reader, Department of Statistics, Shivaji University, Kolhapur.
3. Shirke, D.T. *A study of the confidence regions of the parameters*. Shivaji. Dr. R.N. Rattihalli, Reader, Department of Statistics, Shivaji University, Kolhapur.

Physics

1. Dial Chand. *A study of transient waves in thermoelastic and magneto thermo elastic media*. HP. Dr. J.N. Sharma,

Department of Physics, Himachal Pradesh University, Shimla and Dr. S.P. Sud, Department of Physics, Himachal Pradesh University, Shimla.

2. Ganesh Kumar, T. *Study on oxide materials*. BHU. Prof. O.N. Srivastava, Department of Physics, Banaras Hindu University, Varanasi and Dr. R.S. Tiwari, Department of Physics, Banaras Hindu University, Varanasi.
3. Jadhav, S.R. *Electrical and magnetic properties of substituted copper-zinc ferrite system*. Shivaji. Dr. S.R. Sawant, Department of Physics, Shivaji University, Kolhapur.
4. Singla Chhotu Ram. *Study of A.C. conduction in amorphous semi-conductors at microwave frequencies*. Panjab. Prof. K.K. Srivastava, Department of Physics, Panjab University, Chandigarh.

Chemistry

1. Bassi, Kamal Dev. *Designing of protecting reagents useful in peptide chemistry with handles attachable to polymers*. HP. Dr. C.S. Pande, Department of Chemistry, Himachal Pradesh University, Shimla.
2. Bhardwaj, Shashi Kant. *Molecular and x-ray structure of some dibutyltin (IV) carboxylates and related derivatives*. Panjab. Prof. S.P. Narula, Department of Chemistry, Panjab University, Chandigarh.
3. Jain, Neena. *Derivatization of cross-linked polymers as reagents in organic synthesis*. HP. Dr. C.S. Pande, Department of Chemistry, Himachal Pradesh University, Shimla.

4. Jain, Vinay Kumar. *Studies towards synthesis of some heterosteroids and related compounds*. Panjab. Prof. S.V. Kessar, Department of Chemistry, Panjab University, Chandigarh and Prof. I.R. Trehan, Department of Chemistry, Panjab University, Chandigarh.

5. Kale, B.B. *Modelling of gas solid non-catalytic reactions*. Shivaji. Dr. B.D. Kulkarni, National Chemical Laboratory, Pune.

6. Pandhi, Sat Bhushan. *Studies towards the synthesis of β -lactams*. Panjab. Prof. S.D. Sharma. Department of Chemistry, Panjab University, Chandigarh.

7. Rascovt, Prakash Chand. *A study of transport process of some electrolytes in binary solvent mixtures*. HP. Dr. V.K. Syal, Department of Chemistry, Himachal Pradesh University, Shimla.

8. Singh, Jitender Pal. *Synthesis of new β -lactams as potential antibacterial agents*. Panjab. Prof. S.D. Sharma, Department of Chemistry, Panjab University, Chandigarh.

9. Singh, Sumrit. *Investigations of some dianion reactions of synthetic utility*. Panjab. Prof. S.V. Kessar, Department of Chemistry, Panjab University, Chandigarh and Dr. Y.P. Gupta, Department of Chemistry, Panjab University, Chandigarh.

10. Vohra, Rahul. *Studies towards the synthesis of benzazepine alkaloids*. Panjab. Prof. S.V. Kessar, Department of Chemistry, Panjab University, Chandigarh and Dr. Tejvir Singh, Department of Chemistry, Panjab University, Chandigarh.

Earth Sciences

1. Badoniya, Rajender Kumar. *Ground water investigations in Jajara Block, Tikamgarh District*. M.P. HS Gour. Prof. G.N. Saxena, Reader, Department of Applied Geology, Dr. Hari Singh Gour Vishwavidyalaya, Sagar and Dr. L. P. Chourasia.

2. Bajpai, Rakesh Kumar. *Geological impact on the quality of subsurface water and its effects on the environment, Sagar District*. M.P. HS Gour. Dr. M.V. Durge, Reader, Department of Applied Geology, Dr. Hari Singh Gour Vishwavidyalaya, Sagar.

3. Jain, Ajay Kumar. *A study of geology, hydrology, geohydrology, groundwater availability and soil conservation planning for the area Mandawra and Sumal Regions, District Lalitpur, U.P.* HS Gour. Dr. S.K. Mishra, Reader, Department of Applied Geology, Dr. Hari Singh Gour Vishwavidyalaya, Sagar.

4. Jain, Chaudhary Sunil Kumar. *Geological aspects of Rihand lake near Singrauli with special emphasis on the environmental effects*. HS Gour. Dr. S.K. Babu, Prof., Department of Applied Geology, Dr. Hari Singh Gour Vishwavidyalaya, Sagar.

5. Jain, Jitender Kumar. *An advanced study for planning and monitoring of groundwater availability, utilisation, pollution and its impact on environment in tail reaches of Mataila command, M.P.* HS Gour. Dr. L.P. Chourasia.

6. Jain, Mahender Kumar. *Environmental studies around Katni and adjacent area, M.P.* HS Gour. Dr. M.V. Durge, Reader, Department of Applied Geology, Dr. Hari Singh Gour Vishwavidyalaya, Sagar.

7. Jain, Pawan Kumar. *A study of geology and groundwater hydrology of the area around Gulganj-Angore, Chhatarpur District, M.P.* HS Gour. Dr. S.K. Mishra, Reader, Department of Applied Geology, Dr. Hari Singh Gour Vishwavidyalaya, Sagar.

8. Khare, Arun Kumar. *Geology and quality of surface water and its impact on the environment in and around the Sagar District, M.P.* HS Gour. Dr. M.V. Durge, Reader, Department of Applied Geology, Dr. Hari Singh Gour Vishwavidyalaya, Sagar.

9. Namdev, Mukesh Kumar. *Environmental studies of the coal mines and its surroundings of Chhindwara District, M.P.* HS Gour. Dr. M.V. Durge, Reader, Department of Applied Geology, Dr. Hari Singh Gour Vishwavidyalaya, Sagar.

10. Patel, Dhaniram. *Geological and geochemical inventory of Chauralya area, Damoh District, Madhya Pradesh*. HS Gour. Dr. P.O. Alexander, Reader, Department of Applied Geology, Dr. Hari Singh Gour Vishwavidyalaya, Sagar and Dr. S.S. Dave.

11. Patil, B.S. *Structural and stratigraphic studies around Bawar, Ajmer District of Rajasthan using remote sensing techniques*. Shivaji. Dr. R.R. Patil, Head, Department of Geology, Shivaji University, Kolhapur.

12. Rajeev, S. *A study on ground water resources, evaluation and environmental hazards of the Tawa command area. M.P. using remote sensing techniques*. HS Gour. Dr. L.P. Chourasia and Dr. S.N. Pandey, Reader, Department of Applied Geology, Dr. Hari Singh Gour Vishwavidyalaya, Sagar.

13. Raina, Ravinder Pal Singh. *Structural geology and tectonic history of the precambrian rocks and their bearing on the mesozoic-cenozoic volcanism in the area East of Barwaha City, Western Madhya Pradesh, Central India*. HS Gour. Dr. P.P. Roddy, Reader, Department of Applied Geology, Dr. Hari Singh Gour Vishwavidyalaya, Sagar.

14. Singh, Dinesh Kumar. *Geotechnical and hydrogeological studies of Rajghat Dam project*. HS Gour. Dr. L.P. Chourasia and Dr. R.G. Gupta.

15. Surjeet Kumar. *Geology, coal deposits and environmental problems due to coal mining around Churcha, District Sarguja, Madhya Pradesh*. HS Gour. Prof. G.N. Saxena, Reader, Department of Applied Geology, Dr. Hari Singh Gour Vishwavidyalaya, Sagar.

16. Tiwari, Naresh Kumar. *Remote sensing study of parts of central Rajasthan and detailed structural and metamorphic study of the rocks of the Bhilwara supergroup around Banore in Bhilwara District*. HS Gour. Prof. T.V.G.R.K. Murthy.

Engineering & Technology

1. Baljinder Kaur. *Adsorption of organic organics from aqueous phase by active carbons*. Panjab. Prof. R.C. Bansal, Department of Chemical Engineering and Technology, Panjab University, Chandigarh.

2. Dutta, Debjani. *Studies on very high speed devices*. BHU. Prof. B.B. Paul, Department of Electronics Engineering, Banaras Hindu University, Varanasi.

3. Sharma, Naresh. *Preparation and characterization of carbon molecular sieves*. Panjab. R.C. Bansal, Department of Chemical Engineering and Technology, Panjab University, Chandigarh.

4. Tiwari, Shailash Kumar. *Speech synthesis*. BHU. Prof. Raghunath, Department of Electronics Engineering, Banaras Hindu University, Varanasi.

5. Tiwari, Tapeshwar. *Electron gun*. BHU. Prof. R.K. Jha, Department of Electronics Engineering, Banaras Hindu University, Varanasi.

Anthropology

1. Sonia ABH secretion in health and disease Panjab Prof V Bhalla, Department of Anthropology Panjab University, Chandigarh

Marine Biology

- 1 George C K Studies on the parasites and diseases of marine fishes Kerala Dr S Radhakrishnan Lecturer, Department of Aquatic Biology and Fisheries University of Kerala Trivandrum
- 2 Xavier Barnabas Studies on the functional morphology and ecology on the genus *Chela* from S W Coast of India Kerala. Dr P Natarajan Prof and Head Department of Aquatic Biology and Fisheries University of Kerala Trivandrum

Biophysics

- 1 Sharma Rakesh Kumar Interference of certain chemical agents with epididymal physiology A possible approach to male contraception Panjab Dr N R Kish Department of Biophysics Panjab University Chandigarh

Biochemistry

- 1 Gupta Reena Studies on epithelial cell surface glycosylation in mice intestine Effects of different nutritional regimens Panjab Dr Akhtar Mahmood Department of Biochemistry Panjab University Chandigarh
- 2 Mohini Studies in environmental toxicology Some aspects of the propane-1, 2 diol induced biochemical changes in rat erythrocytes Panjab Dr M K P Amma, Department of Biochemistry Panjab University Chandigarh and Dr J P Nagpal, Department of Biochemistry Panjab University Chandigarh
- 3 Sharma Singgeta Biochemistry of nuclei and metabolism in plant seedlings BHU Dr (Mrs) V Taneja Department of Biochemistry Banaras Hindu University Varanasi

Botany

- 1 Amarjit Kaur Organic acids and fat metabolites of some *Cladosporium* spp Panjab Prof G S Rawla Department of Botany Panjab University Chandigarh
- 2 Ashok Kumar Studies on the anti phytotoxic properties of eucalyptus Panjab Dr K K Kohli Department of Botany, Panjab University, Chandigarh
- 3 Fernandis S F Studies on nitrogen and phosphorus in estuarine ecosystem of Western Maharashtra Shivaji Smt L J Bhosale, Department of Botany Shivaji University Kolhapur
- 4 Kulkarni, P K Some ecological and physiological aspects of *Rhizophora* propagules. Shivaji Dr (Smt) L J Bhosale, Department of Botany Shivaji University, Kolhapur
- 5 Malvinder Kaur Physiological and biochemical aspects of eradication of *Lantana* Panjab Dr R K Kohli Department of Botany, Panjab University, Chandigarh and Dr K K Dhir, Department of Botany, Panjab University, Chandigarh

6. Ramanjit, *Biotechnology of organic acids and fat* from some plectomycetes* Panjab Prof G S Rawla, Department of Botany, Panjab University, Chandigarh

- 7 Ranjit Kaur. *Taxonomy of some North Indian Agarics* Panjab Prof G S Rawla Department of Botany Panjab University, Chandigarh

- 8 Said Shirzadian *Systematic study of some Iranian mosses* Panjab Dr S S Kumar, Department of Botany, Panjab University Chandigarh

Zoology

- 1 Augustine, S *Studies on macro-oobenthic population and their utility as pollution indicators with special reference to industrial effluents at Dewas* Devi Ahilya Dr. A P Diwan, Prof Department of Zoology Govt P G College, Mhow.

- 2 Bhanot R K *Studies on some aspects of the biology of white grubs* Shivaji Dr G P Bhawane, Lecturer, Department of Zoology Shivaji University Kolhapur

- 3 Chona Mukesh Kumar *Biomonitoring and ecological succession of industrial effluents of Chandigarh* Panjab Prof H S Vasishth Department of Zoology, Panjab University, Chandigarh

- 4 Dilip Kumar *Taxonomic studies on some Indian zygothinae with special reference to the external genitalia (Curculionidae Coleoptera)* Panjab Prof H R Pajni, Department of Zoology Panjab University, Chandigarh

- 5 Oulkar J M *Impact of biotic and abiotic factors on the population dynamics of some hairy caterpillars on economic important crops* Shivaji Dr T V Sathe, Department of Zoology, Shivaji University Kolhapur

- 6 Patil P N *Studies on the phytotoxins in the control of molluscan pests* Shivaji Dr S G Nanaware, Department of Zoology Shivaji University Kolhapur

Agriculture

- 1 Nayar, Punam *Agroforestry ecosystem dynamics in Himachal Himalaya* Panjab Prof P K Khosla, Department of Forestry Himachal Pradesh Krishi Vishwavidyalaya, Solan and Dr S S Kumar Department of Botany Panjab University Chandigarh

Medical Sciences

- 1 Chandrasekharan Nair, M K *A study of developmental outcome and effects of early interventional therapy on babies with various perinatal insults* Kerala Dr Elsie Philip, SAT Hospital, Medical College, Trivandrum

- 2 Gopal Das *Biology of human variation A biostatistical approach* BHU Prof G P Dubey, Department of Basic Principles Banaras Hindu University, Varanasi

- 3 Jyothindra Kumar K *Tissue response to orthodontic treatment* Kerala Dr George Jacob, Prof and Head, Department of Orthodontics, Dental College, Trivandrum,

- 4 Tripathi Virendra Kumar *Chemical investigation of medicinal plants with special reference to *Terminalia arjuna* and evaluation of biological activity* BHU Dr V B Pandey, Department of Medicinal Chemistry, Banaras Hindu University, Varanasi and Dr K N Udupa, Department of Medicinal Chemistry, Banaras Hindu University, Varanasi

THESES OF THE MONTH

A List of Doctoral Theses Accepted by Indian Universities

PHYSICAL SCIENCES

Mathematics

1. Chakraborti, Subinay. *On some problems of atomic scattering of charged particles*. Calcutta.
2. Gupta, Babu Lal. *Operations management production planning and control : Application of operation research techniques*. Rajasthan. Dr. B.S. Gupta, Department of Accountancy and Business Statistics, University of Rajasthan, Jaipur and Dr. R. S. Khandelwal, Department of Mathematics, University of Rajasthan, Jaipur.
3. Ramachandra Murthy, V. *Marangoni and Rayleigh-Bernard convection*. Bangalore. Dr. N. Rudraiah, Prof. and Head, Department of Mathematics, Central College, Bangalore.
4. Sucheta. *Dimension subgroups and Schur multiplier*. Panjab.

Statistics

1. Gurumurthy. *Sampling strategies and mixture distributions in crop loss estimation*. Bangalore. Dr. Sundararaj, Department of Statistics, Bangalore University, Bangalore; Dr. T. Srivenkataramana, Department of Statistics, Bangalore University, Bangalore and Dr. M. Nagaraj, Department of Statistics, Bangalore University, Bangalore.
2. Rout, Udaya Nath. *Some properties of a generalized discrete distribution*. Utkal.

Physics

1. Abdul Baten Ahmed. *A study of thermally stimulated luminescence in some feldspars*. Manipur. Dr. R.K. Gartia, Assoc. Prof., Department of Physics, Manipur University, Imphal.
2. Al-eiwei, Mohammad Adel Hamdan. *Studies in atmospheric electrical behaviour with special reference to the kinetics of ionospheric irregularities*. Nagpur. Dr. G.N. Navneeth, Director, Electronics and Spacephysics Laboratory, Department of Physics, Nagpur University, Nagpur.
3. Arivu Oli, D. *Growth of trihalides, chalcogenides chalcogenides of arsenic, antimony and bismuth from vapour and some studies of microhardness behaviour and etching*. Anna.
4. Aroumougame, R. *Fragmentation theory for synthesizing new and heavy elements through heavy ion collisions*. Panjab.
5. Badiger, Nagappa Mahadevappa. *Study of internal Bremsstrahlung in the optical region and in kev region*. Karnatak. Prof. N. Umakantha, Department of Physics, Karnatak University, Dharwad.
6. Bhattacharyya, Prabab Kumar. *The study of tension variation of jute yarns and its effects on the preparatory and weaving operations and fabric properties*. Calcutta.
7. Chaudhuri, Siddhartha. *Crystal and molecular structures of some compounds of biological interest*. Calcutta.
8. Gupta, Anil. *Compton scattering studies of some materials*. Rajasthan. Dr. B.K. Sharma, Department of Physics, University of Rajasthan, Jaipur.
9. Koparkar, Pramila Vinayak. *Studies in ionospheric physics with special reference to ionospheric irregularities and*

VHF scintillations. Nagpur. Prof. G.N. Navneeth, Department of Physics, Nagpur University, Nagpur and Prof. R.G. Rastogi, Indian Institute of Geomagnetism, Bombay.

10. Mohammad Aslam. *A study on locally convex spaces and dual nuclear locally convex spaces*. Magadh.
11. Nath, Malabika. *Some aspects of high energy cosmic ray air shower and multiparticle production phenomena*. Calcutta.
12. Rajegowda, M.B. *Investigations on the growth of external Bremsstrahlung produced by beta particles in thin foils*. Karnatak. Dr. T.S. Mudhole, Reader, Department of Physics, Karnatak University, Dharwad.
13. Singh, Ram Pal. *Rb-Sr dating and Sr isotopic studies of some granites and gneisses of Kumaun and Garhwal Himalaya, U.P. India*. Panjab.
14. Verma, Renu. *Present state of dielectric measurements for amorphous semiconductors*. Panjab.
15. Udaya Shankar, N. *Application of digital techniques to radio astronomy measurements*. Bangalore. Prof. P. Paramashiviah, Department of Physics, Central College, Bangalore and Dr. S. Krishnan, Ramon Institute of Science, Bangalore.

Chemistry

1. Arora, Seema. *Bioactive fluorine containing indoles with C-13 as spiro atom*. Rajasthan. Prof. K.C. Joshi, Department of Chemistry, University of Rajasthan, Jaipur.
2. Ayyaswami, N. *Electro synthesis : Electoreduction of certain azoxes*. Madurai.
3. Chandrasekhara, U. *Kinetics and mechanism of oxidation of some compounds by tetravalent nickel*. Osmania.
4. Dave, Anjani M. *Studies on medicinally important compounds*. Bhavnagar. Dr. P.B. Trivedi, Reader, Department of Chemistry, Bhavnagar University, Bhavnagar.
5. Deshpande, Subhash Bhagwan. *Studies on structural, dielectric and piezoelectric properties of some modified ceramics of Pb (Zr-Ti) O₃*. Shivaji. Dr. P. Roy Chowdhury, Scientist E, Physics Chemistry Division, National Chemical Laboratory, Pune.
6. Dhabre, Ramrao Punjaji. *Inductive and mechanistic studies of oxidation of organic acids in redox reactions viz: Fe (II)-Cr (VI), Fe (II)-Mn (VII) and AS (III)-Mn (VII) reactions*. Nagpur. Dr. B. Madhava Rao, Visveswaraya Regional College of Engineering, Nagpur.
7. Dubé, Bhim Raj. *Physico-chemical studies of the divalent metal complexes of some substituted monothio- β -diketones*. Rajasthan. Dr. A.K. Rai, Department of Chemistry, University of Rajasthan, Jaipur.
8. Dubé, H.N. *Kinetics and mechanism of the oxidation of some diols by N-bromobenzenamide*. Vikram. Dr. V.R. Shastri, Prof. Department of Chemistry, Vikram University, Ujjain.
9. Gokavi, Gavisiddappa Shankarappa. *Kinetics and mechanism of some oxidation reactions*. Karnatak. Dr. J.R. Raju, Reader, Department of Studies in Chemistry, Karnatak University, Dharwad.

- 10 Gupta, Ragini *Fluorine containing bioactive heterocycles* Rajasthan Dr K C Joshi, Department of Chemistry, University of Rajasthan, Jaipur and Dr V N Pathak, Department of Chemistry University of Rajasthan, Jaipur
- 11 Joseph, Lucy *Studies on chelating ion exchange resins*, CUST Dr V N Sivisinkara Pillai Reader, Department of Applied Chemistry, Cochin University of Science and Technology Cochin
- 12 Kalluray Balakrishna *Synthesis characterization and biological activities of some nitrofurans and oxadiazole derivatives*, Mangalore Dr B Shivarama Holla Reader, Department of Chemistry Mangalore University Mangalagangothri
- 13 Katre Y R *A kinetic study of oxidation of some amino acids by chloramine T in micellar system* Vikram Dr S K Solanki
- 14 Laloo Dicky *Kinetics of oxidation of some organic substrates* NEHU Dr M K Mahanti Reader Department of Chemistry, North Eastern Hill University Shillong
- 15 Moh patra Biswamohin *Chemical annealing of damage fragments in gamma irradiated pure and doped potassium nitrate* Utkal
- 16 Mukhtar Singh *Chemical investigation of some Indian and Malaysian medicinal plants* Rajasthan Dr Lalit Prakash Department of Chemistry University of Rajasthan Jaipur
- 17 Murtida Yashvi S *Studies in fluorene containing benzoyl 14 benzoxines and related compounds* Rajasthan Dr K C Joshi Prof Department of Chemistry University of Rajasthan Jaipur
- 18 Nagar P d m Nabh *Dialkyl phosphonate and dialkyl thiophosphonate derivatives of tin (II) and arsenic (III)* Rajasthan Dr R C Mehrotra Department of Chemistry University of Rajasthan Jaipur and Dr G R Srivastava Department of Chemistry University of Rajasthan Jaipur
- 19 Nolini Vetraraj *Crystal engineering and spectroscopy of some thiocarbonyl thiones* Designing the packing of planar aromatic heterocycles using non bonded contacts to sulphur Hyderabad Dr Goutam R Desai
- 20 Pashmina V L *Studies on heterocyclic compounds* Saurashtra Dr A R Parikh Department of Chemistry, Saurashtra University Rajkot
- 21 Pandurang Nikom Bhagwan *Studies in synthesis in some oxazins and flavones* Shivaji Dr M B Hegale Department of Chemistry Shivaji University Kolhapur
- 22 Rajender Kumar *Studies on substituted biologically active nitrogen compounds* Jammu Dr C S Andotra
- 23 Sarali G *Kinetic and mechanistic aspects of oxidation by trivalent silver* Osmania
- 24 Sharma Kanti *Synthesis of some novel fluorine containing heterocycles* Rajasthan Prof K C Joshi Department of Chemistry University of Rajasthan Jaipur
- 25 Sharma Saroj *Photometric determination of transition metal ions with sulphur containing ligands* Rajasthan Dr S P Mathur Department of Chemistry, Govt College Bawar, Rajasthan
- 26 Shetti, Shreedhar Nemanna *Study of metal complexes using thio compounds as ligands* Karnatak Dr A S R Murthy Department of Studies in Chemistry Karnatak University, Dharwad
27. Srinivasan T N *Synthesis of nitrogen heterocycles of biological importance* Reactions with chlorosulfonyl isocyanate, Karnatak Dr. P B Sittur Deputy Director and Head, Organic Chemistry (Drugs), Regional Research Laboratory, Hyderabad.

28 Surama Devi *Synthesis and testing of new herbicides*, Utkal,

29 Syed Mushtak Ali *Stereo-chemistry and thermal behaviour of some metal hydroxamates* Devi Ahilya Dr. P V, Khadkar, Department of Chemistry, Devi Ahilya Vishwavidyalaya, Indore

30 Varma R, Hari Kumar *Studies on some silver (I) complexes* Kerala Dr C P Prabhakaran, Prof, Department of Chemistry University of Kerala, Trivandrum

31 Venugopal, D *Studies in generation of orthoquinol dimethanes and application in synthesis* Panjab.

32. Vijayalakshmi Rao, R *Kinetics and mechanisms of some redox reactions in solution* Mangalore Dr B. Thimme Gowdi, Reader Department of Chemistry, Mangalore University, Mangalagangothri

Earth Sciences

1 Chandra Sekaran V. *Geochemistry of the basic, acid and alkaline intrusives and extrusives of Sarnu Dandali Area, Barmer District Rajasthan* Rajasthan Dr R K Srivastava, Department of Geology University of Rajasthan Jaipur

2 Guptha MVS *Calcareous nanoplankton from the quaternary sediments of the Western Indian Ocean* Andhra

3 Khan A A *Geomorphic evaluation at quaternary sedimentation in upper Ganga Basin, Garhwal Himalaya, U P* Vikram Dr A C Chatterjee Reader, Department of Geology Vikram University Ujjain

4 Paul, Kokkilaigadda John *Studies on low level laterites in and around Visakhapatnam, India* Andhra

Engineering & Technology

1 Bhattacharyulu Yadavalli Chandrasekhara *Rate phenomena in high temperature interphase reactions in a flow system* Nagpur Dr G D. Nageshwar, Director, Laxmi Narain Institute of Technology, Nagpur.

2 Joseph Rani *Curing studies of elastomer blends with special reference to NR/SBR and NR/BR blends*, CUST Dr. D Joseph Francis Head Department of Polymer Science and Rubber Technology Cochin University of Science and Technology, Cochin

3 Mhaissalkar Vasant Anant *Role of rapid mix in the process of flocculation* Nagpur Shri B B Sundaresan, Vice-Chancellor University of Madras, Madras and Shri A G. Bhole, Visveswaraya Regional College of Engineering, Nagpur

4 Nanda Raj Kumar *Resonant response of beams and rectangular plates with discrete viscoelastic dampers and absorbers* IIT, Delhi Prof B C Nakra, Department of Mechanical Engineering Indian Institute of Technology, New Delhi.

5 Rama Gopal, Sarepaka Vizla *Design aspects of some basic photographic objective configurations* A study IIT Delhi Dr B N Gupta Instrument Design Development Centre, Indian Institute of Technology, New Delhi

6 Thukral, Kapil *An analysis of India's oil policy alternatives* IIT Delhi Prof P S Satsangi, Department of Electrical Engineering, Indian Institute of Technology New Delhi

7 Verma, Mukul Ranjan *Fail safe signal processing techniques using microprocessors and application to design and development of route interlocking system for railways* IIT, Delhi Dr. Vinod Chandra, Department of Electrical Engineering, Indian Institute of Technology, New Delhi.

ANNAMALAI UNIVERSITY

DIRECTORATE OF DISTANCE EDUCATION

ADMISSION NOTIFICATION FOR THE YEAR 1988-89

The Directorate offers the following courses of study Admission is open to persons all over India

I Professional Courses

1 B Ed. (English and Tamil Media)

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Eligibility : (i) Any graduate employed teacher working in schools recognised by the Department of School Education, and

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II. Under-Graduate Courses

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3. B A. History (English and Tamil Media)

4 B A. Sociology (English and Tamil Media)

5. B A. Psychology (English Medium)

6. B A. Economics (English Medium)

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8. B.Lit. (Tamil)

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13 M A. History (English and Tamil Media)

Eligibility . B.A./B.Sc.

14. M A. Economics (English Medium)

Eligibility : B.A. Economics or B.Sc. Statistics/B.Sc. Mathematics with 50% of marks in Part III of the B.Sc. Degree.

15 M A Psychology (English Medium)

Eligibility B A or B Sc with 40% of marks in Part III

16 M A Sociology (English Medium)

Eligibility B A B Sc

17 M Sc Mathematics (English Medium)

Eligibility B Sc Mathematics/B.Sc. Statistics

18. M.Sc. Physics (English Medium)

Eligibility B.Sc. Physics

19 M Sc Chemistry (English Medium)

Eligibility : B Sc Chemistry

20 M Sc Zoology (English Medium)

Eligibility B Sc Zoology

21 M Sc. Botany (English Medium)**

Eligibility B Sc Botany

22 M Com (English and Tamil Media)

Eligibility B Com B B A /B A Corporate Secretaryship B A Co-operation

IV (a) Law Degree Courses

23 B A L (Bachelor of Academic Laws) (English Medium)

Duration Three years.

Eligibility Any Degree

24. B G.L (English Medium)**

Duration Two years

Eligibility : Any Degree

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Duration One year

25 (a) Diploma in Company Law with Banking Law and Practice

(b) Diploma in Labour Laws with Administrative Law

(c) Diploma in Law of Taxation

(d) Diploma in Management Laws

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(f) Diploma in Insurance Laws

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V. Management Courses

26. Diploma Courses in Management (English Medium)

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- (c) Post-Graduate Diploma in Business Administration
- (d) Post-Graduate Diploma in Personnel Management
- (e) Post-Graduate Diploma in Marketing Management
- (f) Post-Graduate Diploma in Financial Management

Eligibility : Any Degree

VI. Foundation Courses : (English and Tamil Media)

27. **First Year :** Eligibility : Pass in 10 year SSLC (New Pattern) or an equivalent examination/failed in 11 year SSLC.

28. **Second Year :** Eligibility : Pass in 11 year SSLC or an equivalent examination.

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Duration : One year

29. (a) Diploma in Concrete Technology and Design of Concrete Structures (English Medium)

Eligibility : Diploma in Civil Engineering/B.E. Civil Engineering, B.E. Civil and Structural Engineering

(b) Diploma in Chemical Process, Instrumentation and Control (English Medium)

Eligibility : B.Sc. Graduates with Physics/Chemistry/Mathematics main and ancillary subjects OR Diploma holders in Chemical, Mechanical, Electrical or Electronics Engineering.

(c) Diploma in Maintenance Management (English Medium,

Eligibility : (i) B.E. (Mechanical), B.E. (Production), B.E. (Electrical), B.E. (Chemical).

(ii) A.M.I.E. (Mechanical Electrical/Chemical)

(d) Certificate Course in Automobile Technology (English and Tamil Media)

Eligibility : A Pass in SSLC (X Standard) or equivalent examinations.

****To be introduced this year.**

Caution

Some Private Institutes/Individuals posing as our Agents are allegedly collecting fees, issuing Application Forms and promising admission to our courses. The Directorate has no such Agents and takes no responsibility for their actions. Candidates are therefore advised to correspond directly with the Directorate only.

The candidates are advised to apply direct to the Directorate individually for Application Forms as well as for admission. Applications for admission received through tutorials or any other agency will be summarily rejected.

The cost of application form and prospectus for each course is Rs. 25/-. Applications will be sent to all

by registered post.

Application form and prospectus can be had from the Director, Directorate of Distance Education, Annamalai University, Annamalai Nagar-608002 by sending a requisition along with a crossed Demand Draft for Rs. 25/- drawn in favour of the Registrar, Annamalai University, on any bank at Annamalai Nagar Chidambaram, mentioning clearly the name of the course for which the application form is required and a self-addressed unstamped cover of size 25 cm. x 15 cm. Cheques, Postal Orders, Money Orders and Outstation Demand Drafts are not accepted. Demand Draft should be purchased on or after 1.6.1988.

The last date for receipt of filled in application is 31st August, 1988.

Study Centres have been opened at the following places for the benefit of the students.

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2. 7, Gnanam Colony, 1 Main Road, Ramalinga Nagar, Woriyur, Tiruchi-620 003
3. 15, Dr. Subbarayan Street, Salem-636 001
4. 70, Ammasi Madam Street (Near T.T.C. Bus Stand) Meenakshipuram, Nagercoil-629 001
5. 4, Thiagarajarapuram, Vellore-632 001
6. 276, Annanagar (Near Gupta's Auditorium) Madurai-625 020
7. 47, Basant Enclave, New Delhi-110 057 (Phone No. 607407)
8. DDE Building, Annamalai University, Annamalai Nagar. (Phone No. 2610-Chidambaram)

Liaison Officers at the different Study Centres may be contacted for any further clarification regarding admissions. Applications can be had from the Study Centres also on payment of Rs. 25/- by Demand Draft drawn in favour of 'The Registrar, Annamalai University' as instructed above. Study Centres will remain closed on all Tuesdays, Second Mondays and all other public holidays.

Those who want to get application by post should apply to the Directorate only and not to the Study Centres.

Filled in applications should however be sent only to the Director, Directorate of Distance Education, Annamalai University, Annamalai Nagar, South Arcot District, Tamil Nadu, Pin Code : 608 002. In no case filled in applications should be sent to the Study Centres.

Application and Prospectus can be had from the Directorate of Distance Education, Annamalai University, Annamalai Nagar and Study Centres from 1.6.1988.

Admission cannot be claimed as a matter of right and the Directorate reserves to itself the right of admission.

**K. Ansari Baig
DIRECTOR**

MINISTRY OF DEFENCE
DEFENCE RESEARCH & DEVELOPMENT
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Scientist 'D'	—	Rs. 3700-5000
Scientist 'E'	—	Rs. 4500-5700
Scientist 'F'	—	Rs. 5100-6300
Scientist 'G'	—	Rs. 5900-7300

Under the 'flexible complementing' scheme in operation in DRDO promotions are based on merit

rather than the availability of vacancies.

Universities

The Programme is being conducted in the Universities of Allahabad, Andhra, Cochin, Indore, Madurai, Mysore and Pune.

Eligibility

Candidates possessing a first class Degree in Mathematics, Physics, Computer Science or Electronics from an Indian University or equivalent are eligible for admission.

Age

Not more than twenty three years as on 1st August of the year of admission; this is relaxable by five years in the case of SC and ST candidates.

Admission Procedure

Admissions to the Programme will be made by the respective University directly for which the Universities would issue advertisements in leading newspapers in May-June for the ensuing session. The candidates desirous of joining the Programme should be on the look-out for the advertisements for applying for admission. They can also obtain more information from the office of the Registrar or the Computer Science Departments of the concerned Universities.

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COLLEGE OF PHARMACEUTICAL SCIENCES
MANIPAL

(A Unit of Dr. T.M.A. Pai Foundation)

Applications are invited for admission to B. Pharm. Course commencing in August 1988. Intending candidates should have secured not less than 50% marks in Physics, Chemistry and Biology/Mathematics at the 10+2 level.

Established in 1965, the College attached to the Kasturba Medical College, Manipal, has developed into a centre of specialised learning in pharmaceutical sciences. The College offers courses for graduation and postgraduation studies apart from providing facilities for doctoral research. The College has good residential and recreational facilities also.

For full details and application forms, please apply with a self-addressed envelope (size 10" x 6") affixing Rs. 2.60 postage stamps and a postal order for Rs. 30/- to : The Director of Admissions, Dr. T.M.A. Pai Foundation, Post Box No. 2, Manipal 576 119, Karnataka. Last date for receipt of applications : 30th June 1988.

The Gandhigram Rural Institute

(DEEMED UNIVERSITY)

Gandhigram-624 302 (Anna Dt.) Tamilnadu

Situated in natural rural surroundings 56 Kms north of Madurai in a 260 acre campus Candhigram Rural Institute is engaged in imparting rural oriented higher educated higher education for more than 30 years. It attracts students from all parts of India and some from abroad and the medium of instruction is English. For the 1988-89 session Gandhigram Rural Institute offers the following courses

- | | |
|------------------------------|--|
| I M Phil (One Year) | (i) Micro level Planning (ii) Gandhian Thought and Peace Science |
| II M A (Two Years) | (i) Rural Development (ii) Rural Economics and Extension Education
(iii) Rural Sociology and Panchayat Raj (iv) Co-operative Management
(v) Communicative English (vi) Tamil and Indian Literature |
| III B A (Three Years) | (i) Development Administration (ii) Rural Industries and Management
(iii) Co operation |
| IV. M Sc (Two Years) | (i) Applied Chemistry for Rural Development (ii) Home Science, Extension
for Rural Development (only for women) (iii) Applied Physics |
| V B Sc (Three Years) | (i) Mathematics with Physics and Chemistry (ii) Physics with Chemistry and
Mathematics (iii) Chemistry with Physics and Mathematics (or) with Physics
and Biology (iv) Home Science (only for women) |
| VI Diploma Courses | (i) Agriculture—2 years after PLUS 2 (Tamil Medium) (ii) Bio Gas Techno-
logy and Renewable Energy (1 year) after B Sc (iii) Khadi and Handloom
Technology—Two years after PLUS 2 |
| V Certificate Course | Sanitary Inspector—One year after PLUS 2 (for men only) |

Application forms with the prospects can be had from the Registrar at the address above by sending (a) Crossed Indian Postal Order (not dated before 25th May) drawn in favour of the Registrar for Rs 15/- for M Phil, M A, and M Sc, courses and Rs 10/- for B A, B Sc, Diplom and Certificate Courses payable to the Registrar, Gandhigram Rural Institute Gandhigram at Gandhigram Post Office (b) a self addressed envelope of size 20.5 cm and 11 cm with Rs 2 - stamp affixed indicating on the envelope the course for which admission is sought

The Last Date for the receipt of completed application in this Office is 30th June, 1988

Dr P V Subramanian
REGISTRAR

ANNAMALAI UNIVERSITY

Annamalainagar

No. K2/4/88

Dated : 20-5-88

NOTIFICATION

M.B.A. PROGRAMME-1988-89

Applications are invited for admission to Two Year full time M.B.A. (Semester) programme for the year 1988-89. Application form and prospectus can be had from the REGISTRAR, ANNAMALAI UNIVERSITY, ANNAMALAINAGAR-608 002 on written requisition enclosing (i) a demand draft to the value of Rs. 100/- (Rupees one hundred only) drawn in favour of the REGISTRAR, ANNAMALAI UNIVERSITY payable on Indian Bank or Bank of Madura at ANNAMALAINAGAR, or State Bank of India at CHIDAMBARAM and (ii) a self addressed envelope of size 30 cm. x 13 cm. stamped to the value of Rs. 1.80. The application form together with the prospectus will be issued from 25th May 1988.

Eligibility

A graduate of a recognised University, having secured 55% in the B.A., B.Com., B.B.A. or 60% in the B.Sc., B.E., B.Sc. (Agri.), B.Pharm or an equivalent degree.

Last Date for the receipt of filled in applications by the University is 30.6.88.

The University will not be responsible for any postal delay.

R. Rajamanickam
REGISTRAR

ANNAMALAI UNIVERSITY

ANNAMALAINAGAR

No K2/5/88

Dated : 20-5-88

NOTIFICATION

Admission to M.B.A. Course (Part-time) 1988-89

Applications are invited for admission to the M.B.A. course (Part-time) for the year 1988-89. Application form and prospectus can be had from the REGISTRAR, ANNAMALAI UNIVERSITY, ANNAMALAINAGAR-608002 on written requisition by enclosing (i) a demand draft for Rs. 100/- (Rupees one hundred only) drawn in favour of the REGISTRAR, ANNAMALAI UNIVERSITY payable on Indian Bank or Bank of Madura at ANNAMALAINAGAR or State Bank of India at CHIDAMBARAM and (ii) a self-addressed envelope of size 30 cm. x 13 cm. affixing postage stamps to the value of Rs. 1.80. The application form together with the prospectus will be issued from 25th May 1988.

Qualification for Admission

1. A degree in any discipline with II class from a recognised University and with two years experience in managerial cadre in a manufacturing, marketing, banking organisations, Government Departments, or Government Undertakings.
2. The candidates sponsored by the organisations will be preferred.

The last date for receipt of filled in application forms by the University is 30.6.88.

The University will not be responsible for any postal delay.

R. Rajamanickam
REGISTRAR

ANNAMALAI UNIVERSITY

ANNAMALAINAGAR

No.K2/3/88

Dated : 20-5-88

NOTIFICATION

Applications are invited for admission to the following courses for the academic year 1988-89.

Cost of Application Form and Prospectus

- | | |
|--|----------|
| 1. B.E./B.E. (Chem.) Degree | Rs. 35/- |
| 2. Bi.E./B.E. (Chem.) Degree (Part-time) | Rs. 35/- |
| Branches : 1. Mechanical and Production;
2. Chemical. | |
| 3. M.E./M.E. (Chem.) Degree (Regular and Part-time) | Rs. 35/- |

Branches

1. Structural Engineering (Regular only) 2. Soil Mechanics and Foundation Engineering (Regular only), 3. Water Resources Engineering and Management (Part-time only), 4. Environmental Engineering (Part-time only), 5. Thermal Power Engineering (Regular only) 6. Production Engineering (Regular and Part-time) 7. Power System Engineering (Regular and Part-time), 8. Digital Electronics, Control and Instrumentation Engineering (Part-time) and 9. Chemical Engineering.

- | | |
|--|----------|
| 4. M.C.A. Degree (Master of Computer Applications) | Rs. 50/- |
| 5. Post B.Sc. Diploma in Computer Science and Applications | Rs. 35/- |
| 6. B.Sc. (Agr.) Degree | Rs. 35/- |
| 7. M.Sc. (Agri.) Degree | Rs. 35/- |

Branches

1. Agronomy, 2. Agricultural Entomology, 3. Microbiology, 4. Plant Pathology, 5. Soil Science and Agricultural Chemistry, and 6. Agricultural Economics.

- | | |
|---------------------|----------|
| 8. B. Pharm. Degree | Rs. 60/- |
| 9. D. Pharm. | Rs. 40/- |

For application form and prospectus, the REGISTRAR, ANNAMALAI UNIVERSITY, ANNAMALAINAGAR-608 002 may be addressed by enclosing (i) a Demand Draft to the value indicated against each course drawn in favour of the REGISTRAR, ANNAMALAI UNIVERSITY payable on Indian Bank or Bank of Madras at ANNAMALAINAGAR or State Bank of India at CHIDAMBARAM, and (ii) a self-addressed envelope of size 30 cm. x 13 cm. stamped to the value of Rs. 1.80 (for B.E./B.Sc. (Ag.) (Rs. 5.00) with the name of the course for which the application form is required superimposed boldly on the envelope. The name of the course should be clearly indicated in the requisition letter. The application form together with the prospectus will be issued from 25th May, 1988.

The last date for receipt of filled in applications by the University is as follows :

- | | |
|--------------------------------------|------------------|
| 1. B.E./B.E. (Chem.) and B.Sc. (Ag.) | — 24th June 1988 |
| 2. Others | — 30th June 1988 |

The University will not be responsible for any postal delay.

R. Rajamanickam
REGISTRAR

LOK SABHA SECRETARIAT

Parliament House Annexe, New Delhi

LATEST PUBLICATIONS

AVAILABLE ON SALE

	Price Rs. P.
1. Parliamentary Privileges : Digest of Cases 1950-1985 (Summaries of privilege cases in the two Houses of Indian Parliament. Rulings given by the presiding officers of the two Houses on privilege matters from time to time as well as matters referred to the Committee of privileges of both the Houses have been covered and are put under suitable subject heads)	350.00
2. Nehru and Parliament (The book consisting of scholarly articles and reminiscences from distinguished contemporaries of Jawaharlal Nehru fills a gap in the field of Nehru Studies. It provides valuable insights into the exciting times of our recent past as well as on Nehru's great role in building parliamentary institutions in the country. Among the contributors are Shri. R. Venkataraman, Dr. Bal Ram Jakhhar, S/Shri Uma Shanker Dixit, R.R. Diwakar, Dr. Gopal Singh, Dr. Karan Singh, Professor N.G. Ranga and Dr. Subhash C. Kashyap).	150.00
3. Parliaments of the Commonwealth (The articles and write-ups in this volume describe the organization and functioning of various Parliaments of the Commonwealth countries. The contributors include some of the Speakers, Presiding Officers, the Clerks and Secretaries-General of many Commonwealth Parliaments).	80.00
4. Constitution Amendment in India (This documentary study on the nature, scope and operation of the Constitution amending process in India includes a brief legislative history and synopsis of each of the Constitution Amendment acts).	125.00
5. Glossary of Idioms (The publication contains about 5000 English expressions, idioms and proverbial sayings alphabetically arranged at one place with their equivalents in Hindi and particular emphasis on spoken words).	80.00
6. Unparliamentary Expressions (Published for unrestricted circulation for the first time, this work contains references to words and expressions, in English, Hindi and other Indian languages declared unparliamentary in the Central Legislative Assembly, Constituent Assembly of India (Legislative), Provisional Parliament, First to Seventh Lok Sabhas, State Legislatures in India and some of the Commonwealth Parliaments, including the British House of Commons).	100.00
Other Important Publications	
7. Lok Sabha Debates (for each sitting)	6.00
8. National Electronics Policy	20.00
9. Namibian Question	20.00
10. Tourism Policy of Government of India	12.00
11. President's Rule in the States and Union Territories	10.00
12. Foreign Policy of India	20.00
13. Electing the President	15.00
14. Background to evolving a National Information Policy	12.00
15. Indian Ocean as a Zone of Peace	15.00
16. National Science and Technology Policy	20.00
17. Council of Ministers. 1947-1987 (including Supplement)	18.00
18. Documentation Series-Biographies	45.00
19. Lok Sabha Members, Eighth Lok Sabha—Permanent and Delhi Addresses and Telephone Numbers.	6.00

20. Government of India, Demarcation of Responsibilities—Subjects for which Different Ministries are responsible	10.00
21. Non-aligned Movement	15.00
22. Central Legislature since 1921—Sessions and Presiding Officers	7.00
23. Disarmament and Development	20.00
24. National Energy Policy	20.00
25. Transport in India	15.00
26. Members of Lok Sabha (First to Eighth Lok Sabha) A Study in Socio-Economic Background	15.00
27. Documentation Series—Agriculture	75 00
28. Constituent Assembly Debates (6 Volumes)	475.00
	(Postage Extra)
29. Model Parliament—An Introductory Guide	10.00
30. Rules of Procedure and Conduct of Business in Lok Sabha	10.00
31. Directions by the Speaker, Lok Sabha	7.50
32. Handbook for Members of Lok Sabha	10.00
33. Abstracts of Parliamentary Procedure	35.00
34. Eighth Lok Sabha—Who's Who	65 00
35. Legislative Councils in States—Their Creation and Abolition	5.00

Periodicals	Price (per copy)	Annual Subs.
	Rs. p.	Rs. p.
1. Journal of Parliamentary Information (Quar.)	16.00	60.00
2. Digest of Legislative and Constitutional Cases (Quar.)	8.00	30.00
3. Digest of Central Acts (Quar.)	8.00	30.00
4. Abstracts of Books, Reports and Articles (Quar.)	6 00	20.00
5. Public Undertakings : Digest of News and Views (Monthly)	5.00	50.00
6. Diary of Political Events (Monthly)	5 00	50.00
7. Documentation Fortnightly (Fortnightly)	10 00	200.00
8. Privileges Digest (Half-yearly)	10.00	20.00

Monographs	Price (per copy)
	Rs. P.
1. Nehru—A True Democrat by Shri R. Venkataraman, President of India	12 00
2. Jawaharlal Nehru as External Affairs Minister in Parliament by Shri N.D. Tiwari, Minister of Finance	10.00
3. Jawaharlal Nehru—The Maker of Modern Commonwealth, by Dr. Shankar Dayal Sharma, Vice President of India.	10.00
4. Servicing Parliament	10.00
5. Parliament in the Indian Polity	15.00
6. Socio-economic Background of Lok Sabha Members	10.00
7. Parliament as a Multi-functional Institution	10.00
8. Parliamentary Museum and Archives	10.00
9. Parliaments and Information Dissemination	10.00
10. The Parliament of India	10.00
11. Parliament and Humour	10.00
12. Eighth Conference of Commonwealth Speakers	10.00
13. Vice-Presidential Election in India	10.00

Note : Nos. 4 to 13 are by Dr. Subhash C. Kashyap, Secretary-General, Lok Sabha. Publications can be had from and further enquiries addressed to local sales agents or Sales Section, Lok Sabha Secretariat, Parliament House Annexe, New Delhi-110001.

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UNIVERSITY OF DELHI SOUTH CAMPUS

BENITO JUAREZ ROAD, NEW DELHI-110 021

ENTRANCE EXAMINATION FOR ADMISSION TO M.TECH. IN MICROWAVE ELECTRONICS

Applications are invited on the prescribed forms from the candidates to appear in the above examination for admission to M.Tech. in Microwave Electronics to be held on Friday the 8th July, 1988 at 10.00 A.M. at the above address.

Qualification : For admission to M.Tech., the Candidate should have passed M.Sc. in Electronic Science or M.Sc. in Physics Examination of Delhi University/other Universities with 55% marks in M.Sc. or equivalent grade. **OR** B.E. (Electrical Electronics Engineering) Examination from Delhi University or an examination recognised as equivalent thereto with 55% marks or equivalent grade.

General Information : (i) No person shall be qualified for admission to the M.Tech. Course in Microwave Electronics unless he/she is 21 years of age on or before 1st October, 1988.

Provided that Vice-Chancellor on the basis of individual merit may relax the age limit upto a maximum of one year.

(ii) The questions in the Entrance Examinations would be based on the following topics :

Analogue and Digital Electronics, Communication Electronics, Computer Programming, Mathematics, Electromagnetic Theory, Microwaves, Opto-Electronics and Microprocessors

(iii) Ten stipends of Rs 600/- each are available which will be awarded to admitted candidates in order of merit in the Entrance Examination.

The application forms can be obtained by sending a self-addressed stamped Re 1/- envelope of 10"x4½" size to the Dean, Faculty of Inter-Disciplinary & Applied Sciences, University of Delhi South Campus, Benito Juarez Road, Dhaula Kuan, New Delhi-110 021.

The completed applications alongwith a Passport size Photograph must reach the Dean's Office by 24th June, 1988.

P.L. Kada/baju
DEPUTY REGISTRAR

INSA MEDAL FOR YOUNG SCIENTISTS--1989

Instituted by the Indian National Science Academy in 1974 the Medal is awarded annually in recognition of outstanding work of scientists below the age of 32 (as reckoned on 31st December preceding the year of award). Only those born on or after January 1, 1957 are eligible for consideration in 1989. The work done in India by the nominee will be taken into consideration for the award.

The awardee is presented a medal and a cash award of Rs 5,000/-. In addition, the recipient is considered for a research grant by the Academy not exceeding Rs 20,000/- per year, including stipend for a JRF for a period of three years for continuing research work, provided the research proposal is considered worthy of such support. Preferential consideration may be given under partial travel grant scheme for attending international conferences.

Nominations for the awards for 1989 may be made by Fellows of the Academy, established scientific societies of all India character, University faculties and departments, or the research institutions.

The last date for the receipt of nominations in the Academy is November 15, 1988.

Nomination Proforma can be obtained from the Indian National Science Academy, Bahadur Shah Zafar Marg, New Delhi-2 by sending a self addressed envelope of 28 cm x 12 cm size.

PANJAB UNIVERSITY (CHANDIGARH)

(Advertisement No. 6/88)

Applications are invited for the following posts so as to reach the Registrar, Panjab University, Chandigarh alongwith Postal Order of Rs 10/- by June 15, 1988

1 Deputy Registrar: (1) (Permanent) likely to increase

Grade: Rs 1400-60-1700-EB-75-2000 plus Rs 100/- p.m. as Special Pay.

2 Assistant Registrar. (4) (Permanent) likely to increase.

Grade. Rs. 940-30-1000 40-1200/50-1400/60-1700-75-1850 plus Rs. 100/- p.m. as Special Pay.
and

Rs. 1200-50-1400/60-1700 75-1850 plus Rs 100/- as Special Pay for in-service candidates from amongst Superintendents and Personal Assistants (Selection Grade).

Qualifications and Experience

For Post at Sr No. 1

Essential: (i) Master's or LL B degree of recognised University or its equivalent qualification

OR

- (ii) A University employee with not less than 25 years of service in the University and who has worked as Asst Registrar for a period of not less than four years shall be eligible to apply for the post of Deputy Registrar irrespective of the qualifications prescribed.

Desirable At least 5 years' administrative experience at the level of Superintendent, P.A. or above in a University or an educational institution.

OR

10 years' teaching experience in a College or a University (5 years' in the case of a teacher with Ph D. degree), preferably with experience of administration at College/University, such as Head of the Department, Bursar, Registrar (Exams), Officer-Incharge NCC, etc.

OR

Comparable qualifications in Research Establishment and other institutions of higher education.

For Posts at Sr. No (2)

Essential : Master's or LL B degree of a recognised University or its equivalent qualifications Superintendents/PAs or persons holding equivalent posts in the administrative (ministerial) staff of the Panjab University with the following qualifications/experience

- (i) 10 years' service in the existing post (irrespective of the qualifications prescribed).

OR

- (ii) 3 years' service in the existing post with B A, being the minimum qualification, provided the total service as Assistant/Stenographer or equivalent or higher posts is not less than 15 years

OR

- (iii) (*) "5-years' service in the existing post in the case of matriculates provided the total service as Assistant/Stenographer or equivalent and higher post is not less than 20 years

(*) This is subject to approval of the Syndicate.

Desirable : At least 2 years' experience of educational administration and sufficient knowledge of organisation and working of a University/affiliated colleges.

Persons already in service should route their applications through proper channel. Incomplete forms and those received after the due date are liable to be rejected unless the Vice-Chancellor condones the delay or discrepancy by a special order. Attested copies of certificates in support of the qualifications and experience be attached to the applications. Serving employees may, however, send their applications on the prescribed proforma direct to the University. They may route another copy through their department. They will be allowed to present themselves for interview only on the production of 'No Objection Certificate' from their employers. Canvassing in any form will disqualify the candidates. Higher start to deserving candidates admissible.

The Vice-Chancellor could place before the Selection Committee the name(s) of suitable person/s for its consideration alongwith the applications received in response to the advertisement.

It is not obligatory on the part of the University to call for interview every candidate who possesses the essential qualifications.

The number of vacancies may change. The University may also prepare panel of suitable candidates for appointment against vacancies occurring within a specified period

Application forms can be obtained from the Cashier, Panjab University personally on payment of Rs 2/- or by making a written request to the Asstt. Registrar (Estt.), Panjab University, Chandigarh accompanied with self-addressed *stamped* envelope worth Rs. 3.40 of 23 x 10 cms. a Postal Order of Rs. 2/- drawn in favour of the Registrar, Panjab University, Chandigarh-160014.

CLASSIFIED ADVERTISEMENTS

ALIGARH MUSLIM UNIVERSITY ALIGARH

Advertisement No. 2/88-89

Dated : May 15, 1988

Applications on the prescribed form are invited for the following posts :

Professor : Rs. 4500-7300 plus allowances.

Readers : Rs. 3700-5700 plus allowances.

Lecturers : Rs. 2200-4000 plus allowances.

1. Professor of Arabic, Department of Arabic.

Qualifications

I—Essential

An eminent scholar with published work of high quality actively engaged in

research. About ten years experience of teaching and or research. Experience of guiding research at doctoral level.

OR

An outstanding scholar with established reputation who has made significant contribution to knowledge.

II—Desirable

Knowledge of modern Arabic language and literature and command in written and spoken Arabic.

2. Reader in Political Science, Department of Political Science

3. Readers in Computer Science, Department of Computer Science

4. Reader in Home Science, Women's College

Qualifications

I—Essential

Good academic record with a doctoral degree or equivalent published work.

Evidence of being actively engaged in (i) research or (ii) innovation in teaching methods or (iii) production of teaching materials.

About five years experience of teaching and/or research provided that at least three of these years were as Lecturer or in an equivalent position.

This condition may be relaxed in the case of candidates with outstanding record of Teaching Research.

**II—Desirable : For Post at Sl. No 3
Reader in Computer Science**

Experience of teaching and research in any of the areas of Theoretical Computer Science, Operating System, Information Systems, Computer Architecture, Computer Graphics and Communication networks.

5. Reader in Civil Engineering (Structural Engineering), (Temporary but likely to become permanent), Department of Civil Engineering.

6. Reader in Mechanical Engineering (Field Mechanic), Department of Mechanical Engineering.

Qualifications

I—Essential

A good academic record with a Doctor's degree in a relevant field. About five years experience of teaching and/or research and development.

Provided further that candidates not possessing Ph.D. may be considered if they have to their credit equivalent research published work or design development work of a high order either in the institution or in an industry.

OR

In the case of persons to be recruited from Industry or Professional fields, candidates should possess good academic record with recognised professional work of about seven years which should include innovation and/or research and development.

II—Desirable: For Post at St. No. 6 Reader in Mechanical Engineering (Field Mechanic).

Published research work in reputed Journals, teaching experience to Post-graduate classes.

7. Lecturers in Arabic (One permanent and one Temporary but likely to become permanent), Department of Arabic.

8. Lecturers in Computer Science, Department of Computer Science

Qualifications

I—Essential

- (a) A Doctor's degree or research work of an equally high standard, and
- (b) Good academic record with atleast second class (C in the seven point scale) Master's degree in a relevant subject from an Indian University or an equivalent degree from a foreign University.

Having regard to the need for developing interdisciplinary programmes the degrees in (a) and (b) above may be in relevant subjects.

Provided that if the Selection Committee is of the view that the research

work of a candidate as evident either from his thesis or from his published work is of very high standard, it may relax any of the qualifications prescribed in (b) above.

Provided further that if a candidate possessing a Doctor's degree or equivalent research work is not available or is not considered suitable, a person possessing a good academic record (weightage being given to M.Phil. or equivalent degree or research work of quality) may be appointed provided he has done research work for atleast two years or has practical experience in a research Laboratory Organization on the condition that he will have to obtain a Doctor's degree or give evidence of research of high standard within eight years of his appointment, failing which he will not be able to earn future increment until he fulfils these requirements.

II Desirable: For Post at St No 8 Lecturers in Computer Science

Experience of teaching and research in any of the areas of Theoretical Computer Science, Operating Systems, Information Systems, Computer Architecture, Computer Graphics and Communication networks.

9. Lecturers in Electrical Engineering, Department of Electrical Engineering.

Qualifications

I—Essential

- (a) Master's degree in appropriate field in engineering technology.
- (b) Consistently good academic record with a bachelor's degree in Engineering Technology. First class at Bachelor's degree and/or Master's degree level.
- (c) One year's relevant professional experience outside academic research institutions.

Having regard to the requirement of emerging fields of Engineering and of developing inter-disciplinary programmes, the requirements of Engineering technology degrees may be waived in the cases of otherwise well qualified candidates.

Provided further that if a candidate does not possess professional experience or a person possessing such experience

is not found suitable, the person appointed will be required to obtain desired professional experience within a period of five years of his appointment failing which he will not be able to earn future increments, until he fulfils this requirement.

If the candidates with M.Tech./M.E. qualifications are not available or not found suitable for appointment the essential qualifications may be relaxed and first class Engineering graduates may be appointed subject to the condition that the candidate concerned shall have to obtain the M.Tech./M.E. degree within a period of five years failing which he will not be able to earn future increments until he acquires the prescribed qualifications.

10. Lecturer in Architectural Assistantship, University Polytechnic.

Qualifications

Bachelor's degree in architecture plus two years of relevant professional experience.

OR

Master's degree in architecture and one year's relevant professional experience.

Provided further that if a candidate does not possess a master's degree in architecture and professional experience or a person possessing such experience is not found suitable, the persons appointed will be required to obtain the desired professional experience within a period of five years on his appointment failing which he will not be able to earn future increment until he fulfils this requirement.

11. Reader in Bio-Physics, Department of Bio-Chemistry, JN Medical College.

Qualifications

I—Essential

- M.D. (Biophysics)/
- Ph.D. (Biophysics)/
- M.D. (Physiology) or
- M.D. (Bio-Chemistry) with one year training in Bio-physics

Teaching/Research Experience.

As Lecturer in Bio-Physics for five years in a Medical College.

II—Desirable

The candidate should have made notable contributions in Biophysics/Bio-physical Chemistry and in particular in the areas of conformation of proteins, nucleic acid, conformational transitions and protein folding

Job Specifications

The selected candidate will be responsible for organising the teaching and research programme in Biophysics particularly in the areas of structural studies of Proteins and nucleic acids

Note If candidates with Medical qualifications are not available or are found unsuitable, candidates with Ph D Degree in Physics Chemistry who have worked on Biophysical problems for 5 years after obtaining their Ph D degree may also be considered for appointment

12. Reader in Anatomy (Temporary), Department of Anatomy

Qualifications

M S (Anatomy)
MBBS with M Sc (Anatomy)
Ph D (Medical Anatomy)/
D Sc (Medical Anatomy)

Teaching Research Experience

As Lecturer in Anatomy for 5 years in a Medical College

13 Reader in Cardiothoracic Surgery, Department of General Surgery

Qualifications

I—Essential

M Ch (Thoracic Surgery)

Teaching Research Experience

As Lecturer in Thoracic Surgery for 5 years in a Medical College

II—Desirable

Research experience and publications in the speciality

14 Assistant Librarian (Two posts) (Permanent) Mainland Azad Library

Scale of Pay: Rs. 700-1600 plus allowances (Pre-revised)

Qualifications

I—Essential

(a) Good academic record with at least High Second Class Master's degree in a subject other than Library Science

(b) First class or high second class Master's degree in Library Science.

II—Desirable

At least three years experience as Professional Assistant in a University or an Institution of higher learning Experience Knowledge of documentation work/Computer based information work

15 Medical Officer (Blood Bank) (One post) (Permanent) JN Medical College Hospital

Scale of Pay Rs. 700 1600 plus allowances (Pre revised)

Qualifications

I—Essential

- (a) M B B S
(b) PG Degree or Diploma in Pathology.
(c) Three years experience as Blood Transfusion Officer in a recognised Hospital or three years experience of working in a Blood Bank of a teaching Hospital

II—Desirable

Special training in Blood Transfusion from a recognised institution

16. System Analyst Grade II (One post) (Temporary but Likely to continue), C.C Unit, Controller's Office

Scale of Pay 1640-60-2600-EB-73-2900 plus allowances

Qualifications

I—Essential

- 1 Post B Sc Diploma in Computer Science Applications/Bachelor's Degree in Computer Science
2 At least three years experience of using packages like file editor, word processor dBase, LOTUS-1-2-3-etc which should include

atleast one year experience of operating system management on multi programming time sharing Computer System

3 Working knowledge of command language and Programming language like FASCAL, BASIC, FORTRAN COBOL

OR

- 1 Bachelor's Degree in Science
2 Atleast five years experience of using packages like File editor Word Processor dBASE LOTUS-1-2-3 etc and operating system management on multi programming time sharing Computer System
3 Working knowledge of command language and Programming languages like FASCAL, BASIC FORTRAN, COBOL

17 Staff Nurses (17 posts) (Permanent) JN Medical College Hospital

Scale of Pay Rs 1400-40-1600-50-2300-EB 60-2600 plus allowances

Qualifications

Essential

Registered Nurse and Registered Midwife of B Sc (Nursing)

18 Technical Personal Assistant (Computer) (One post) (Temporary but likely to continue) C C Unit, Controller's Office

Scale of Pay Rs 1400-40-1800-1B 50-2300 plus allowances

Qualifications

I—Essential

- 1 Bachelor's degree.
2. Diploma in Computer Programming
3. Atleast two years experience of operation of time sharing Computer System using software packages like File Editor, Word Processor, dBASE LOTUS-1-2-3 etc

OR

- 1 B Sc degree.
2 Atleast three years experience of operation of time sharing Computer System using software packages like File Editor, Word Processor, dBASE, LOTUS-1-2-3 etc.

19. Technical Assistant (Store) (One post) (Permanent) Department of Bio-Chemistry, Faculty of Life Sciences.

Scale of Pay : Rs 1400-40-1800-EB 50-2300 plus allowances

Qualifications

I—Desirable

- 1 B Sc / B Com
- 2 Two years experience in the relevant field after obtaining degree

II—Desirable

- (a) The experience should preferably be in Biochemistry or Chemistry Department
- (b) Knowledge of use of microcomputers in maintaining stores inventory and accounting

20 Technical Assistant (Store) (One post) (Permanent) Department of Applied Physics, Z H College of Engg & Technology

Scale of Pay Rs 1400-40-1800-EB 50-2300 plus allowances

Qualifications

I Essential

B.Sc / B Com with two years experience in the relevant field after obtaining degree

OR

Diploma in Mech/Elect Engg with three years experience in the relevant field after obtaining Diploma

II—Desirable

Experience in Book Keeping and Accounts

21 Research Associates (Two posts) (Temporary), Department of History

Scale of Pay : on a fixed honorarium detailed below

Category	Value
'A'	Rs 1,400 p.m.
'B'	Rs 1,600 p.m.
'C'	Rs 1,800 p.m.
'D'	Rs 2,000 p.m.

Qualifications

I—Essential

Doctoral Degree and independent published work in any field of Medieval Indian History

II—Desirable

Age below 45 years (For Men) and Age below 55 years (For Women)

22 Trained Graduate Teacher (Urdu) (One post) (Permanent) A M U City High School

Scale of Pay Rs 1400-40-1800 EB 50-2300 plus allowances

Qualifications

I Essential

- 1 Graduate with Urdu on one subject in the graduation Course (or equivalent recognised degree)
- 2 Degree Diploma in Education
- 2 Atleast five years experience of teaching upto High School classes in a recognised Institution

II—Desirable

Ability to arrange extra curricular activities such as Drama and debates etc

23 Trained Graduate Teacher (Physics) (One post) (Permanent) A M U City High School

Scale of Pay 1400-40-1800-EB 50-2300 plus allowances

Qualifications

Essential

- 1 B Sc. (with Physics as one of the subjects)
- 2 Recognised degree or Diploma in Education.
- 3 Ability to teach through Urdu, Hindi and English medium

24 Trained Graduate Teacher (Chemistry) (One post) (Permanent), A.M.U. City High School

Scale of Pay 1400-40-1800-EB-50-2300 plus allowances.

Qualifications

Essential

- 1 B Sc (with Chemistry as one of the subjects)
2. Recognised degree or Diploma in Education
- 3 Ability to teach through Urdu, Hindi and English Medium

25 Key Punch Operator Gr I (Four Posts) (Permanent) Computer Centre

Scale of Pay Rs 1320-30-1560-EB-40-2040 plus allowances (Revised)

Qualifications

Essential

- 1 Bachelor's degree or Diploma in relevant field
- 2 Atleast two years experience of handling data processing machines and of using packages like File editor Word Processor, dBASE, LOTUS 1-2-3 etc on PC Computers Key in speed 10 000 depressions per hour

OR

- 1 Higher Secondary or equivalent
- 2 Atleast 6 years experience of handling data processing machines and of using packages like File editor Word Processor dBASE, LOTUS-1 2 3 etc on PC/Computers Key in speed 10 000 depressions per hour

26 Senior Laboratory Assistant (One post) (Permanent) Department of Physics

Scale of Pay 1320-30-1560-EB-40-2040 plus allowances

Qualifications

I—Essential

- 1 B Sc
- 2 One year experience in the relevant field after obtaining degree

OR

- 1 Higher Secondary (Science)
- 2 Six years experience in the relevant field after passing Higher Secondary.

27. Primary Teacher (One post) (Permanent), A M U City Branch School

Scale of Pay : 1200-30-1560-EB-40-2040 plus allowances

Qualifications

1. Matric trained

OR

Higher Secondary with J.B.T.
2 years.

OR

Intermediate (or 10+2 course)
with J.B.T. one year.

OR

Graduate with five years teaching
experience in Primary School
(with the proviso that he/she will
complete a recognised formal
training course within three
years).

2. Ability to teach through Urdu/ Hindi/English medium.

28. Wireman (Three posts) (Permanent), Department of Electricity (Work & Maintenance Section)

Scale of Pay : Rs. 975-25-1150-EB-30-
1540 plus allowances.

Qualifications

(i) Wireman's Licence

(ii) Two years experience of different
types of internal wiring.

Note: The candidates will have to
undergo a practical test before interview.

Higher initial start may be given to
candidates possessing exceptional qual-
ifications and experience. Candidates in-
terviewed may be paid contribution to-
wards their T.A. equal to one single
second class Railway fare only.

Prescribed application forms and in-
structions may be had from the Assistant
Registrar (Selection Committees),
Registrar's Office, A.M.U., Aligarh
on payment of Rs. 10/- for posts at
S.No. 1 to 16 and Rs. 7/- for remaining
posts to be deposited in the Cash
Section, Finance Office, A.M.U., Aligarh
or through an Indian Postal Order pay-
able to the Finance Officer, A.M.U.,
Aligarh either personally or by sending a
self-addressed stamped envelope of
size 9" x 4".

Last date for receipt of applications
is 30th June, 1988 (during office hours).
Incomplete applications and those receiv-
ed late will not be considered.

Javed Umami (IAS)
REGISTRAR

SARDAR PATEL UNIVERSITY

VALLABH VIDYANAGAR-388 120
(Gujarat)

Notification No. EST/2(1988-89)

WANTED

I. Professor of: (1) Computer
Science (M.C.A. Course) and
(2) Education.

Pay Scale : Rs. 1500-2500.

II. Reader in: (1) Statistics (2)
Home Science (Foods and Nutri-
tion—Two posts) and (3) Library
Science.

Pay Scale : Rs. 1200-1900.

III. Lecturer in: (1) Sociology
(2) Economics (3) Education; and
(4) Library Science.

Pay Scale : Rs. 700-1600.

IV. Non-teaching Posts: (1)
Co-ordinator (Temporary for Exa-
mination Reforms Unit) (2) Statistic-
ian (Temporary for Examination
Reforms Unit) and (3) Technician
(For Physics Department).

Pay Scale: For (1) and (2):
Rs. 3000-4500 and for (3) Rs. 2200-
4000.

All posts except at Sr. No. IV
(1) and (2) carry benefits of
Dearness Allowance, G.P.F.,
Gratuity and Pension as per
University rules, posts at Sr. No.
IV (1) and (2) carry D.A. only.
Qualified candidates from SC/ST
will be given preference. SC/ST
candidates must attach bonafide
certificate from proper authority.

Applications for the above
posts must be made in the prescrib-
ed forms available on payment of
Rs. 5/- in cash or by I.P.O. to the

University. Detailed qualifications
will be supplied with the forms.
The last date for receipt of applica-
tions is 20.6.1988.

Niranjan Upadhyaya
i/c. REGISTRAR

UNIVERSITY OF MADRAS UNIVERSITY BUILDINGS

Chennai, Madras-5

NOTIFICATION

Applications are invited for admission
to the following courses in the Uni-
versity Departments at the Dr. A.L. Mada-
llar Post-Graduate Institute of Basic
Medical Sciences, Taramani, Madras-
600 113, during the academic year 1988-
89;

MD Course in Microbiology
MD Course in Physiology
MD Course in Pharmacology
MD Course in Pathology
Diploma Course in Clinical Pathology

Prospectus and Application Forms
can be had from the Registrar, Uni-
versity of Madras, Madras-600 005, on
requisition with a Demand Draft for
Rs. 30/- (Rs. 20/- for the Prospectus and
Application Form for Diploma in Clinical
Pathology Course) drawn in favour
of the Registrar, University of Madras,
together with a self-addressed stamped
envelope (size 28 x 13 cms.) for Rs. 1-80.
Last date for issue and receipt of filled in
applications is 30th June, 1988. Postal
Orders and Money Orders are not accept-
ed. Filled in applications should be sent
directly to the Head of the University
Department concerned at Dr. A.L. Mada-
llar Post-Graduate Institute of Basic
Medical Sciences, Taramani, Madras-
600 113 and not to the Registrar, Uni-
versity of Madras, before the expiry of the
last date.

The University reserves the right to
start or suspend the conduct of any of the
above courses, if the circumstances so
warrant.

Major Dr. P. Kuttippaan
REGISTRAR

UNIVERSITY OF KALYANI
KALYANI, WEST BENGAL-741235

Adv No. 3/88

Dated : 23.5.88

Applications in prescribed form are invited for the undermentioned posts on the scale mentioned below with allowances as admissible under the University rules.

- 1 Professor of Sociology — One post
Specialisation in any branch of Sociology
- 2 Lecturer in English — One post
Specialisation in any branch of English
- 3 Medical Officer — One post
- 4 Reader in Education — One post
Desirable qualification—Educational Technology / Ednl. Statistics & Psychology Research Methodology / Teaching Learning Mental Health & Hygiene
- 5 Lecturer in Commerce — One post
Specialisation Accountancy at the Degree level.

Desirable : Professional degree
Diploma in Accountancy.

- 6 Professor — One post
(in DSA programme in Botany) Temporary
Specialisation in any branch of Botany relevant to Molecular Botany and Doctorate Degree

Scale of Pay : Professor—Rs. 1500-60-1800-100 2000-125 2-2500 -

Reader and Medical Officer—Rs. 1200-50-1300-60-1900 -

Lecturer—Rs 700-40-1100-50-1600 -

Age Professor and Reader—Preferably below 50 years

Lecturer—Preferably below 40 years

Medical Officer—Age not below 35 years Relaxable in the case of exceptionally qualified candidates.

Those who had applied previously in prescribed form for the post of Professor of Sociology vide Adv. No. 784 dated 21-12-84 need not apply again. Such candidates may update their biodata. A circular containing details of qualifications, pay and allowances and other

relevant information may be had from the office of the undersigned from 1-6-1988 to 21-6-1988 between 11-30 a.m. and 3 p.m. on working days separately or alongwith the application form on payment of Rs. 7.50 (charge one fourth for scheduled caste and scheduled tribes candidates) by current Crossed Indian Postal Order in favour of the "University of Kalyani" personally or by sending self-addressed stamped (Rs. 1.80) envelope (25 cm x 12 cm) Application forms complete in all respects according to instructions given in the circular must reach the office of the undersigned on or before 21-6-88

The principle of reservation of posts for candidates to Scheduled castes and scheduled tribes shall be followed to the extent possible as per orders issued by the State Govt. from time to time

The scheduled castes and tribes candidates must produce copies of caste certificate from the appropriate authority (S.D.O.) in their own area at the time of collection forms. Candidates called up for interview will have to appear for the same at their own cost.

P. Sircar
REGISTRAR

**INDIRA KALA SANGIT
VISHWAVIDYALAYA**

KHAIKARAGARH, M.P., 491 881

APPLICATIONS are invited for the following posts in the University Teaching Departments, viz A—PROFESSOR One for Instrumental Music, B—READERS Three, one each for 1 Reader-cum-Director for Research Cell, 2 Kathak Dance, 2 Violin, C—LECTURERS Two, one each for 1 Flute (Instrumental Music) 2 Thumri (Vocal Music) D—MATRON for girls hostel

Scales of Pay Professor 1500-60-1800-100-2000-125 2-2500, Readers 1200-50-1300-60 1900 -, Lecturers 700-40-1100-50-1300 - Assessment-50-1600 - (Pre-revised scales), Matron. 500 - (Fixed pay)

Qualifications For Professor, Readers and Lecturers, as prescribed by the University Grants Commission. Details of

qualifications for Professor, Readers and Lecturers, as also for other posts may be obtained from the Registrar.

POSTS are permanent and carry CPF benefits and DA/ADA at University rates from time to time. Appointments will be on probation according to University rules. Retirement age 60 YEARS.

RESERVATION for posts for SC/ST will be according to Government rules. If candidates are not available or not found suitable, posts will be filled up from general categories.

PRESCRIBED forms (in four copies) obtainable by sending self-addressed stamped envelope of Rs. 3.00 for 25 x 12 cms Application fee Rs. 25/- for PROFESSORS, Rs. 20/- for READERS, Rs. 15/- for LECTURERS, Rs. 5 - for MATRON in the form of IPO Last date for receipt of applications in four copies is 25th June 1988. The University reserves the right to keep vacant any of the advertised posts without assigning any reason.

CANDIDATES called for interview, will be required to come at their own costs. The University does not pay TA DA or any other expenses for journey for interview.

CANDIDATES will be provided dormitory type free lodging (without bedding) in the University Campus, if informed well in advance

CANDIDATES who are in service, must apply THROUGH PROPER CHANNEL. However, if necessary, three copies may be sent to this office and fourth copy may be sent through employer and NO OBJECTION CERTIFICATE must be produced at the time of interview.

M K GangaJaliwale
REGISTRAR

**MASS COMMUNICATION
RESEARCH CENTRE
JAMIA MILLIA ISLAMIA**

JAMIA NAGAR, NEW DELHI 110025

Advertisement No T/1988

Dated 25.5.1988

The Mass Communication Research Centre invites applications for the following posts :

I. Reader in Radio (one post)
(Revised pay scale : 3700-5300)

Educational & other qualifications

Essential

- (i) Degree of a recognized University;
- (ii) Degree or Diploma or equivalent in Radio Production from a recognized University or Institute.
- (iii) At least 4 years' professional experience including teaching in the Radio Production in an institution or organization of repute.

OR

- (i) Master's Degree of a recognized University; and
- (ii) At least 6 years' professional experience including teaching in the Radio Production in an institution or organization of repute.

OR

- (i) Degree of a recognized University or equivalent;
- (ii) At least 8 years' professional experience including teaching in Radio Production in an institution or organization of repute.

Desirable

Good knowledge of Radio, Film and TV medium in India and abroad.

II. Library Attendant (one post)
(Revised Pay Scale : 800-1150)

Educational & other qualifications

Essential

- (i) Higher Secondary/Matric
- (ii) Certificate in Library Science.

NOTE

Above any of the qualifications mentioned above can be relaxed at the discretion of

the Selection Committee in the case of candidates otherwise exceptionally qualified.

DA, CCA, HRA, PF, Gratuity, Pension and other benefits will be given as per Jamia rules.

Application forms can be had from the Administrative Officer, Mass Communication Research Centre, Jamia Millia Islamia, on any day except Saturdays, Sundays and Holidays either personally between 10 : 00 a.m. to 1 : 00 p.m. or by sending a self-addressed and stamped envelope. Application should be accompanied with crossed Indian Postal Order or a Bank Draft for Rs. 7/- (Rs. 2/- for SC/ST candidates) in the name of the Administrative Officer, Mass Communication Research Centre, Jamia Millia Islamia, New Delhi-110025.

The last date for receipt of applications is 27.6.1988.

M. B. Mughal
ADMINISTRATIVE
OFFICER

KALPATARU INSTITUTE OF TECHNOLOGY

TIPTUR-572 202

Estd. By Kalpataru Vidya Samsthe, Tiptur.

(Affiliated to Bangalore University)

Applications are invited from the eligible Candidates for admission to the First Year B.E. Degree Course in (1) Electronics Engineering, (2) Computer Science, (3) Instrumentation Technology, and (4) Mechanical Engineering (Under approval of Bangalore University) for the year 1988-89. The minimum qualification required is a pass in the Two Year PUC of Karnataka or an equivalent; with 50% aggregate in P.C.M. group. It is 35% in the case of SC, ST & BT Candidates. The prescribed application form and the Prospectus of the Institute can be had from the Principal, on Payment of Rs. 50 - at the Institute's counter or by sending Rs. 60/- through M.O. or D.D. in favour of the Secretary, Kalpataru Vidya Samsthe, Tiptur. The filled-up application form with all enclosures should be sent to the Principal to reach him on or before July 10th 1988. The Institute has well equipped Laboratories, Workshops and Library, in addition to separate hostel facilities for Boys and Girls situated on the Campus. Any change in the Schedule will be notified in the Press.

T.M. Manjunath
PRESIDENT

N. Basavaiah
EXECUTIVE SECRETARY

Dr. T.G. Visweswaraiya
PRINCIPAL